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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

HOLSTEIN DAIRIES.

From the Journal of the English Agricultural Society.

"The pride and boast of the Holsteiner is his dairy; and the fame of Holstein butter, which, if we except that made in Holland Proper (or Delfland,) may well claim to be the best in the world, not only justifies his preference, but may render a sketch of those peculiarities of management, by which the Holstein dairy system is more especially distinguished, neither uninteresting nor useless to the English farmer. These may be chiefly classed under four heads, viz.: the buildings and utensils; the time of milking, and number of hands employed; the management of the milk; and the mode of working, salting, and packing the butter.

The buildings indispensable to a large dairy (which varies from 100 to 400 cows) are, a milk cellar, a butter cellar, a churning house, (and closely adjoining the horse-mill, by which the operation of churning is invariably effected,) a cheese room and a kitchen, in which not only the various utensils are washed, but the food cooked for all the persons immediately engaged in the dairy-work; to which must commonly be added their sleeping and eating apartments, as, on large estates, the whole of the establishment is usually kept apart from the mansion house. The size and site of the milk cellar are esteemed matters of first rate importance: it ought to front the north; be shaded from the southern sun by rows of trees —elder being especially selected for this purpose, and indeed placed if possible near the windows, on account of their influence in keeping off the insect tribes; and a thatched projecting roof is preferred, affording greater protection from the heat: while, in choosing the site, peculiar care is taken to place the dairy beyond the reach of every thing calculated to generate bad odors, or in any way taint the atmosphere. The size of the milk cellar must necessarily be regulated by the number of cows: but it should always be calculated to contain the produce of four milkings; and as the milk dishes usually occupy a space of two feet square, the produce of 100 cows, giving on an average 8 quarts per day, (a large average for the cows of this country throughout the year,) would fill 50 milk dishes at each milking, and would require a ground surface of 500 square feet, as the milk dishes are invariably placed on the floor, the amount of each milking a little apart; and there must unavoidably be spaces left, to enable the dairy maids to go through their various operations of skimming, sieving, and removing cream, &c. The floor, though sometimes flagged, is more generally of brick, neatly fitted, so that no water may lodge in the joints; and always gently inclined, with a grated opening at the lower end, to facilitate the mopping and washing of the floor, which is never omitted to be done twice a day, notwithstanding that every avoidable impurity is carefully guarded against, and every drop which may fall at the time of the milk being strained, is instantly wiped up. A great improvement has been recently made in some newly arranged dairies, by dividing the floor into compartments with brick ledges, from 3 to 4 inches high, between which the milk dishes stand; and the compartments (the lower extremity of which is fitted with a small sluice) being filled, by means of a pump, with cold water twice a day, the milk is preserved so cool as to prevent all approach to acidity for several hours longer than when placed on a dry floor: thus affording, even during the summer solstice, sufficient time for a complete separation of the milk and cream, without which the full proportion of butter cannot be obtained. For effectuating the same desirable result, ice is frequently resorted to in sultry weather, either by dropping a piece of pure ice in each milk-pan, or by placing a pailful in the dairy, which, by giving off its cold, sensibly lowers the atmospheric temperature.

It is considered necessary that the milk cellar should be sunk from 3 to 4 feet in the ground; be from 16 to 18 feet high (the best have an arched roof, as being more conducive to coolness than boards); and be furnished with two rows of windows, (and, if possible, on three sides, north, east, and west,) to secure a thorough air. The lower range consists of wooden trellis work, provided inside with gauze frames to exclude insects, and outside with hanging shutters, which can be lowered and elevated at pleasure. The upper range is furnished with glass sashes when light only is requisite, which are exchanged for gauze frames, when more coolness is desirable. The butter-cellar also, must be light, airy and cool; being likewise sunk in the ground, and the same precautions adopted as in the milk cellar, to secure an abundant current of pure air. In it the butter, when carried from the churning house, is worked, salted, and packed; and the filled butter casks ranged on clean boards, somewhat elevated above the floor, to admit a free passage of air, are weekly turned and wiped.

Next in order comes the churning house, which differs in no respect from similar arrrangements in England, excepting that, of late years, the perpendicular movement of the churn staff has been exchanged for the rotatory,* which is found to churn in a shorter time, and with less risk of producing, even in hot weather, what is called oiling.

The cheese room is never admitted near either milk or butter cellar, and is, in newly arranged dairies, placed as far as may be from them. In fact, as cleanliness forms the great object of the Holstein dairy system, the closest attention is paid to guard against every impurity, and to remove every thing from the vicinity of the dairy which could by possibility exercise a sinister influence on the very susceptible substances of milk and butter; which suffer, to a degree those unaccustomed to observe it would little suspect, from a tainted atmosphere. As the preparation of cheese is better understood in England than here, I will only mention that three sorts are made—sweet milk, skimmed milk, and occasionally what is termed cream cheese; and shall now proceed to describe the man-

* Seventy-two revolutions per minute.

agement of the milk, first enumerating the number of persons required. These consist, in large dairies of a meyer or overseer, a cooper, one or two cowherds, (as may be requisite,) one or more swineherds, an upper dairywoman, and dairymaids in the proportion of 1 to every 18 cows. The overseer's duty involves a general charge of the cattle, whether in health or sickness, with a competent knowledge of their diseases and the remedies; he is responsible for the swine being properly cared for; that the calves, whether fatting or rearing for stock, are regularly and suitably fed; that the cowherd does his duty; that the hours of milking are punctually adhered to; and that every thing and every person is in proper place and keeping. He must further pay strict attention that the cows are milked thoroughly out, on which so very much depends; as not only the cow which is allowed to retain any portion of milk diminishes her produce by so much from day to day, but the last, being by far the richest part, a loss of butter is incurred much more than proportionate to the quantity of milk, by this culpable negligence or laziness. According to the observations of an accurate examiner, Dr. Schubler, the first drawn milk contains only 5, the second 8, and the fifth 17 per cent. of cream! If the number of cows be not above a hundred, the overseer can also undertake the cooper work; which, when wooden milk dishes are used, in addition to the cream barrels, milking pails, and butter casks required in the course of a year is a consideration both of time and expense. But in large dairies, a cooper is kept in addition, who, however, must likewise milk a certain number of cows, assist in carrying the milk, feeding the cows when housed, or any other dairy work which a man is capable of. The wages of these two persons vary according to the extent of the dairy, but may be averaged the first at 60, and the second at 40 dollars per annum.

The dairymaids, besides milking, cleaning the vessels, &c., work in the garden in summer, spin in winter, and wash, bake, brew and cook for their own establishment, under the superintendence of the upper dairywoman, who is by far the most important personage in it, as on her skill, attention, and diligence depend, in great measure, both the quantity and quality, and, by consequence, the profit of the produce. She must not only thoroughly understand, but accurately observe, the moment when the milk should be creamed; the degree of acidity it must attain in the cream barrels; its temperature, whether requiring the addition of warm or cold water to the churn, as well as the all-important operations of kneading, beating, salting, and packing the butter. She must not only be punctiliously clean herself in person and work, but keep a strict eye over the cleanliness and order of her subordinate maidens. In very large dairies the upper woman has full employment, without milking, and needs the assistance always of one, and sometimes of two, of the more experienced dairymaids, in butter and cheese making; but in smaller establishments she milks a certain number, generally 10 cows, while each of her subordinates have 18; her wages are usually 55 to 60, that of her chief assistants 22, and that of the others 18 dollars per annum.

During summer the dairy people must rise at three and even two in the morning, if the weather be very hot; for which they are indemnified by two hours' sleep, from 1 to 3 in the afternoon. At 4 they commence milking, which takes place in the field, and generally occupies two hours. At the beginning of the season each girl marks her own cows by tying a particular colored ribbon round their tails, and in some places they adopt the precaution of the milkers carrying a string on which they cast a knot as each cow is successively milked, thus securing against one being forgotten. As the fields are large, and often at a great distance, the transport of the milk is facilitated by the very simple contrivance of a long, low, four-wheeled, one-horse wagon, in the side bars of which strong iron hooks are inserted, at such distances that the milk pails, containing from 30 to 40 quarts each, may swing free of each other, and these, though filled nearly to the brim, are prevented spilling, notwithstanding many a rude jolt over the rough, and often deeply rutted road, by merely having thin pieces of wood, about the size of a dinner plate floating on the surface; a practice, indeed, universal in these countries, when pails with any liquid are carried even in the hand. The milk when brought to the dairy is immediately strained through a hair sieve into the vessels, whether of wood, earthenware, copper tinned, zinc, cast-iron, (lined with a china-like composition,) or glass, placed in rows on the floor. All these different kinds of utensils have been tried with various success, in the hope of discovering how, in hot weather, more especially when a thunder storm is gathering, the milk can be guarded against a too early acidity; for, as it is a fixed and invariable rule that the cream must be removed from the milk before the latter gets at all sour, and an equally established fact, that all the oily particles cannot be obtained in a shorter period than 36 hours, vessels in which, during sultry, and especially damp weather, the milk could be kept the due time, are a great desideratum. As yet, however, there reigns much diversity of opinion on the subject, and shallow wooden vessels, as nearly as possible equally wide at top and bottom, containing when full about 8 quarts, but in which during summer seldom more than 6 quarts are poured, are in most general use. The tinned copper milk pans are very costly, and must be carefully watched lest they should require retinning. The zinc are as yet little known, and the assertion of their effect in better severing the cream from the milk, not sufficiently proved. The cast-iron, lined with enamel, though assuredly durable and very clean, seem too expensive; and the glass have many opponents on account of their brittleness, and the vague notions respecting glass and electricity inducing the idea, that if the electric fluid get into the milk it cannot get out again! Whereas, as it is ascertained that it always attaches itself to a conductor, and, in the absence of any thing more attractive, runs along the surface, it is more likely that the milk should be protected in glass, which is a non-conductor, than in any other substance. In my dairy which contains upwards of 180 cows, the glass vessels have been used for 4 years; and I give them a decided preference over all others. Their form is good, being 16 inches broad at the top and 12 at the bottom: the glass is dark bottle-green, transparent; and perfectly smooth, about one eighth of an inch thick, and provided with a rounded rim at the upper edge which makes it easy to retain a safe hold of them even when full. They contain 8 quarts, but never

receive more than 6. They cost 8*d*. a piece, and their durability may be estimated by the fact, that to encourage carefulness, each dairy maid is allowed one dollar per annum extra, as *pan money*, being bound at the same time to pay 10*d*. for each one she breaks, yet hitherto no girl has broken to the extent of her dollar. It is self-evident that acidity cannot be communicated to glass, and the ease and rapidity with which they are cleaned, requiring merely to be first washed with lukewarm water, them rinsed in cold water and placed in a rack to dry, effect such a saving in fuel and labor (diminishing the number of our dairy maids by at least 2,) that the less quantity of butter obtained, supposing (which I by no means concede) that the milk, during a few weeks in summer, does sour sooner, and consequently throws up less cream in glass than in wood, is more than compensated by the lessened expense of the establishment, not to mention the great advantage of attaining the indispensable cleanliness and purity of the vessels, with more certainty, because at a less expenditure of time and trouble. Although it is an ascertained and undeniable fact that the quality of butter depends much on the nature of the pasture, the locality of the dairy, the universally prevailing cleanliness of the whole management, and very essentially on the purity of the water employed, still I ascribe much of the reputation which our butter has of late years enjoyed (and which is verified by our obtaining at all seasons one penny per pound above the market price in our neighborhood) to the beneficial introduction of glass milk dishes.

It has already been stated as a rule, that the cream must be removed from the milk before any acidity is perceptible, if butter of first rate quality is looked for; and it has been found by experience that a cellar temperature of from 60° to 62° Fahrenheit, is the most favorable; a complete disseverment of the cream then taking place in 36 hours: whereas a greater degree of warmth, though it quicken the separation, still more hastens the souring process, which operates injuriously not only on the quality but the quantity of butter. In a cold temperature, the separation is effected much more slowly, so that 48 or even 60 hours may be required; this, however, is the longest period that may be accorded without incurring the risk of imparting a rank, unpleasant flavor to the butter, which even if not perceptible on its being first churned, manifests itself very shortly afterwards.

The commencement of acidity in milk is indicated by a very slight wrinkling of the cream, and a scarcely perceptible acid taste. So soon as these signs appear, the work of skimming must begin, even though the milk have only stood 24 hours; and the cream is poured through a hair sieve (which is kept for this purpose, and must never be used to strain up the new milk with) into large barrels, containing about 240 quarts each (usually sufficient for one churning,) in which it remains till the necessary sourness is attained, which in summer follows in 24, in winter seldom under 36 or 48 hours; unless when the small quantity of milk admits of it being partly strained at once into the cream barrel, and the remainder added without skimming from the milk pans when cool. This method, undoubtedly, gives at all seasons the greatest return of butter, but as is generally believed, not of so rich a quality as that produced from cream alone; and, moreover, in a large dairy, during the time the cows are in full milk, would occasion much additional trouble, an almost ceaseless churning, and a total prevention of cheese making. The cream having attained its requisite acidity, during the advance to which it must be frequently stirred with a small churn staff to prevent it coagulating, technically called becoming cheesy, the next object of the dairywoman's skill is, the degree of warmth or coolness which must be imparted in order to secure good butter. In warm weather the churn is rinsed with the coldest procurable water, in which a piece of pure ice is often thrown, and sometimes, though more rarely, cold spring water is added to the cream about to be churned, which operation is then always performed either very early in the morning or late in the evening. In cold weather, on the contrary, warm water is applied, both to rinsing the churn and to the cream itself. The churning being completed, the butter is taken off by means of a large wooden ladle, and carried in a tub directly to the butter cellar, where, in a large trough, hollowed out of the trunk of a beech or oak, very smoothly polished off inside, and provided with a plug hole at the lower extremity, (beneath which a small tub is placed to receive the expressed milk,) the butter is slightly worked, and salted with the purest salt, then moulded with the wooden ladle into a mass at the upper end of the trough, and left for some hours to soak and drain. In the evening it is thoroughly kneaded and beat, or rather slapped, the dairy maid repeatedly lifting a piece of from 3 to 4 pounds, and slapping it with force against the trough, so as to beat out all the milky particles; and thus, lump after lump being freed from extraneous matter, the whole mass is spread out, receives its full proportion of salt in all about $1\frac{1}{8}$ oz. per pound,) which is worked with the utmost care equally through it, and again moulded into one compact mass. The butter in Holstein is seldom if ever washed, as water is believed not only to rob it of its richness and flavor, but as being itself susceptible of putrefaction, to be equally inimical as milk, to its preservation. When a sufficient quantity is ready to fill a cask, the several churnings are once more kneaded through, a very little fresh salt added and packed into the barrel, which is made of red beech wood, water tight, and previously carefully washed and rubbed inside with salt. Much attention is paid that no interstice shall remain either between the layers of butter or the sides of the cask. A cask is never begun to be filled until it can be completed, as thus alone the butter can be exactly of the same flavor and color, which is probably one reason why small dairies, under whatever management, never produce such good butter as large ones, as the small churnings must remain long exposed to the air, until the requisite quantity is in readiness.

The qualities of first rate butter are considered to be, 1st, a fine, even yellow color, neither pale nor orange tinted; 2d, a close, waxy texture, in which extremely minute and perfectly transparent beads of brine are perceptible; but if these drops be either large or in the slightest degree tinged with milk color, it indicates an imperfect working of the butter; while an entirely dry, tallowy appearance, is equally disapproved; 3d, a fresh fragrant perfume, and a sweet kernelly taste; 4th, good butter will, above all, be distinguished by keeping for a considerable time, without acquiring an old or rancid flavor. * * *

The quantity of food which can be afforded to the cows during winter, is ascertained at the beginning of the season, when the harvest returns are known; and in plentiful years the calculation is, that each cow should be allowed 3 sacks of grain, (generally oats of 140 lbs. each sack.) 3900 lbs. of straw, including bedding, and 1800 lbs. of good hay; whilst for every hundred pounds of hay less, she must receive 25 lbs. of grain more, or vice versa.

As during the winter months, when the cows are confined to dry food, the butter loses its fine yellow color, the defect is sought to be remedied by an admixture of coloring matter; and indeed a high color in butter so much regulates its price in some markets (as in Spain and Portugal,) that the export merchant insists on the desirable shade being imparted when it ceases to be natural. The best ingredients for this purpose are found to be, a mixture of annotta and turmeric, in the proportion of 5 oz. of the latter to 1 lb. of the former.

The average quantity of milk obtained here from good stock, may be estimated at from 2000 to 3000 quarts per annum, according to the food and care bestowed on them; the produce of which has been calculated in the following ratio; every 100 lbs. of milk will give 3¼ lbs. of butter, 6 lbs. fresh cheese, 14 lbs. butter-milk (exclusive of the water added before and after churning,) and 76¾ lbs. of whey; and, though the qualities of individual cows, the nature of their pasture or other food, and the atmospheric changes, occasion an almost endless variety of result, still it may be considered as a fair average that 15 quarts of milk are required for a pound of butter; for although from some cows a pound may be obtained from 12 quarts, yet others and even the same cows, at different seasons and with different food, (such as beets or raw potatoes,) will not produce a pound of butter from less than 17 or 18 quarts. On the whole, it is esteemed a fair return in these duchies when the average produce of the dairy amounts to 100 lbs. of butter and 150 lbs. of cheese per cow. When calves are fattened for the market, so much butter and cheese cannot be expected—from the generally received opinion that fine veal (and the veal of these countries is very fine,) can only be secured by feeding the milk fresh from the cow; they are usually fed for 10 or 12 weeks, and attain the weight of from 120 to 150 lbs. when slaughtered.

BALLOON ADVENTURE AT NIGHT.

From Blackwood's Magazine.

Mr. Holland, a gentleman of scientific habits, projected the enterprise which has strikingly signalized ærostation of our day. On Monday Nov. 7, 1836—at half past one in the afternoon, the balloon rose from Vauxhall Gardens [London] with a moderate breeze from the south-east. It passed over Kent. The weather was singularly fine. At five minutes past four they saw the sea. After passing Canterbury, the course altered towards the north, which would have carried them into the German ocean. The point was now to change the course in the direction of Paris. Ballast was now thrown out, the balloon rose in an upper current, recovered her direction to the south-east, and crossed the Straits of Dover in exactly an hour, about 8000 feet above the level of the sea.

It was fifty minutes past five, consequently the balloon rapidly plunged into the night. The aspect of the world beneath now became curious in the extreme. The whole plane of the earth's surface for leagues round, as far and farther than the eye could distinctly embrace, seemed absolutely teeming with the scattered fires of the population, and exhibited a starry spectacle below, that almost rivalled the lustre of the firmament above. Incessantly, during the early portion of the night, before the inhabitants had retired to rest, large sources of light, exhibiting the presence of some more exclusive community, would appear just looming above the horizon in the direction in which they were advancing, bearing at first no faint resemblance of some vast conflagration. By degrees as they grew higher, this confused mass of illumination would appear to increase in intensity extending over a large portion of the view, and assuming a more distinct appearance, until at length as the balloon passed directly over the spot, it suddenly resolved itself into streets and squares, exhibiting the perfect model of a town, but diminished into curious minuteness by the height from which it was seen. In this manner the æronauts rapidly traversed a large space of the continent, embracing a vast succession of towns and villages solely distinguished by their nightly illumination. One of those views singularly captivated their attention. They approached a district which seemed actually to blaze with innumerable fires, studding the whole horizon. As they swept along, they saw a central city in the midst of this circle of flame, with every line of its streets marked out by its particular range of illumination. The theatres and other public buildings, the squares, and all the more prominent features of the city, were indicated by the larger accumulations of light. They could even hear the busy murmur of the population—the whole forming an earthly picture of the most striking contrast to the darkness, the serenity, and the silence of the vast region above in which they were moving. This was the city of Liege, whose surrounding iron foundries formed the horizon of flame. This was the last spectacle of the kind which met their eyes. Thenceforth it was all midnight, every sound was hushed, every light died, and all was solemn and awful obscurity. Withdrawn from the earth, which was buried in the profoundest stillness, they looked to the heavens. There was no moon. The hue of the sky was intensely black, but the stars, redoubled in their lustre, shone like sparks of the whitest silver. Occasional flashes of lightning in the north.

In a situation, which it was never in the power of man to describe before, the sketch of night given by Mr. Mason, has all the interest of a new source of ideas. "Nothing," says this clever describer, "could exceed the density of night, which prevailed during this part of the voyage. Not a single terrestrial object could any where be distinguished. An unfathomable abyss of darkness visible seemed to encompass us on every side. And, as we looked forward into its black obscurity in the direction in which we were proceeding, we could scarcely resist the impression that we were cleaving our way through an interminable mass of black marble, in which we were imbedded, and which, solid a few inches before us, seemed to soften as we approached, in order to admit us

further within the precincts of its cold and dusky inclosure. Even the lights, which at times were lowered from the car, instead of dispelling, seemed only to augment the intensity of the surrounding darkness, and as they descended deeper into its frozen bosom, absolutely to meet their way downwards." The cold was at the point of congelation. The oil, the water, and the coffee were completely frozen. Yet the sufferings of the æronauts were not severe, in consequence of their being entirely exempt from the action of the wind.

While they were thus rushing on with almost whirlwind rapidity through the ocean of darkness, yet almost unconscious of motion, an incident occurred calculated to alarm them in an extraordinary degree. By the discharge of ballast the balloon had suddenly risen to an elevation of about 10,000 feet, (about two miles.) In a few moments after they heard a violent burst from the top of the balloon, followed by a loud rustling of the silk, and all the signs of its having been torn suddenly open. Immediately the car began to toss, as if severed from the ropes, and appeared to be sinking to the earth. A second and a third explosion followed rapidly, evidently giving the voyagers the impression that they were upon the point of being dashed to pieces.

But the alarm was brief. The great machine suddenly recovered its stillness, and all was calm again. The concussions were subsequently accounted for by the stretching of the network on the surface of the balloon, which had become frozen during the night. When the machine suddenly shot up into the higher atmosphere, it swelled, and it was the resistence of the frozen network to this swelling, which produced the successive explosions. The sinking of the car was an illusion, occasioned by the surprise and suddenness of the action. When the network had been relieved, and the balloon was thus suffered to take its proper shape, all was calm and regular once more.

During the darkness they were sometimes perplexed with sounds from either earth or air, so strongly resembling the heaving of waters against some vast line of shore, that they were tempted to think themselves speeding along the shores of the German ocean, or hovering above the Baltic. From this apprehension, however, they were relieved by their recollection that their course was unchanged. At length they saw the day, but saw it under the most novel and interesting circumstances. About six o'clock, after crossing the Rhine, the balloon rose to a considerable elevation, and showed them a gladdening glimpse of the sun. The view was now magnificent; the balloon occupying the centre of a horizon of three thousand miles in diameter and comprising in a single vast view scarcely less than eighty thousand square miles. The country that spread below was a rich, undulating, boundless landscape, with the Rhine dividing it, and losing itself among the vapors that still clung to the hills, or covered the valleys. The ascents and descents of the balloon still more varied the prospect. A rapid descent first hid the sun from their view, and they were wrapped in the night which still shadowed the lower regions of the air. Again they rose within sight of this splendid display: again lost it. And it was not until after they had made the sun rise three times, and set twice, that they could regard daylight as complete on the mighty expanse below.—They now thought of making their final descent. But the question arose—"where were they?" They saw below them ranges of forest, wide plains, and large spaces covered with snow, giving the rather startling impressions that they had passed the bounds of civilized Europe, and were hovering over the deserts of Poland, or the Steppes of Russia. However, they now resolved upon descending; and after two attempts, baffled by the failure of the wind, and the nature of the ground alighted in safety, at half past six in the morning, in the Grand Duchy of Nassau, and about two leagues from Wellburg. The voyage occupied about eighteen hours, and was in extent about five hundred British miles.

From the Kentucky Farmer.

EXPERIMENTAL CROP OF CORN.

Bourbon County, near Centreville, October 5, 1840.

Dear Sir:—You will be pleased no doubt to learn the result of an experiment made by me in the cultivation of corn. The certificate below, will show the quantity of ground cultivated and the amount of product, and it remains only to describe the character of the soil, and seed, and the mode of cultivation.

The soil was good, but not new. It had been in meadow for many years previous to the last seven. The five first of last seven, it was in hemp: the last but one it was in rye, and the last in seed hemp.

The seed was of a variety well known in this neighborhood, particularly among distillers, who speak of it as yielding more spirits than any other kind. It is yellow, and has a medium ear in size, a firm deep grain, very small red cob, shells easily, and in shelling yields abundantly. For several years past I have been improving it, by a careful selection of seed, and the result has been an increase in the number and size of the ears. It matures about two weeks earlier than other corn commonly does.

In its cultivation I was governed by the principles, that the *roots* were not to be *broken*; that a good *bed* was to be given the roots to occupy; that *light* and *heat* should get to them equally, and that the whole *power* of the soil should be brought into action without being burdened. I first, as soon as it could be done after the frost was out of the soil, gave it a deep ploughing with a Cary plough. In April, just before planting, I spread over the whole surface a thin coat of fresh stable manure in its unfermented state; then cross ploughed with the same plough; then harrowed; then laid off rows two feet apart with a shovel plough; dropped the seed in the bottom of these rows, as near one foot apart as I could; covered with hoes, and in so doing made the surface level, every clod being crushed with the eye of the hoe, and I then pressed the whole down tight with a good roller. When the corn was about one foot high, I had the weeds cut with a sharp hoe by scraping, great care was taken not to break the surface nor to hill the corn. It had but one hoeing of this sort, and the laborer was about one day in doing it.

The manure, though green from the stable, as the season was wet, was of much service, which I suppose would not have been the case, had the season been dry.

In my opinion the experiment proves unequivocally, that in wet or rainy seasons, such as the past has been, a crop of corn may be trebled, and that with a great reduction of labor. What could be done such a year as was that of 1839, remains to be tested. Very respectfully, &c.

GEO. W. WILLIAMS.

Bourbon County, September 24, 1840.

We do certify, That we have this day accurately measured the quantity of corn grown by Geo. W. Williams, as an experiment in the mode of cultivation; that we have also accurately measured the land so cultivated by him, and we find the land contains one acre and one eighth of an acre, and the quantity of corn is one hundred and seventy-eight bushels, making at the rate of *one hundred and fifty-eight bushels and two-ninths of a bushel* to the acre.

WILL. P. HUME,
GEO. MOORE,
JOSEPH H. CLAY,
R. P. RANKINS,

BUCKWHEAT.

From the Cultivator.

Mr. Haynes of Natick informs us that he has eight acres of his light warm land in buckwheat. He sowed it on the third of July, on the furrow, after once ploughing, and in addition to his buckwheat seed he sowed one bushel of rye to the acre. The rye has come up and is waiting for the buckwheat to be taken off, when it will take its turn. Mr. H. means to let it grow until June, then plough it in and sow buckwheat and rye again—the one for harvesting and the other for a next year's green crop. Mr. Haynes ploughed his land but once. A neighbor of his ploughed similar ground twice, and his crop is not so good as that where the plough went but once.

IRISH POTATOES RAISED FROM SLIPS.

Mr. Cortselt, of Stapleton, near Bristol, has succeeded in raising this valuable root from the cuttings. Mr. C. says, reasoning upon the analogy of the potato to the dahlia, I was induced in the spring to try an experiment on cuttings, and have succeeded admirably, having from white-apple and Fox's seedlings (an early potato) produced a good crop of full sized potatoes, many of which weighed half a pound.

The method was this: when the potatoes were about nine inches high, I cut off the tops about six inches long, planted them in a line about eight inches apart with a flat dibble, pressing the earth carefully against them, gave them water and afterwards hoed them as an ordinary crop. I produced this way at the rate of 140 pounds per rod. —*English paper.*

IRON COTTAGES.

A model of a cottage, entirely constructed of iron, has been exhibited in Glasgow, of an elegant structure, and so well adapted to the purposes designed, that no doubt can be entertained of its fitness for general adoption, as well on the English coast, as in the interior. The model contains six chambers, a kitchen, wash-house, and other conveniences. A cottage constructed according to this model, would cost 250*l.* sterling. A double house, that is, one containing fourteen chambers, would cost 500*l.*, which is not half the cost of a similar one built of common materials. Besides, it could be prepared in the course of two months. The iron trade of a country might gain much by this kind of construction.—*Rec. Soc. Polyt.*

PRESERVING FRUIT FROM LATE FROSTS.

The fruit of trees whose precocious bloom exposes them to the destructive influence of late frosts, may have their flowering retarded by a removal, during, the winter, of the earth around the roots; so as to permit the frost to descend deeper, and thus to check the too early ascension of the sap. Many southern horticulturists have resorted to this plan with respect to their almonds apricots, peaches, &c. In this way the flowering has been retarded more than a fortnight, and late frosts have not attacked them.—*Idem.*

INSPECTIONS OF TOBACCO IN VIRGINIA, TO SEPTEMBER 30.

	1839.		1840.
Petersburg	6616	Petersburg	14123
Richmond	9992	Richmond	20738
Lynchburg	6936	Lynchburg	13613
Farmville	2381	Farmville	4552
Danville	735	Clarksville	2710
Milton	480	Milton	520
Clarksville	1307	Danville	927
Tye River	210	Deans	200
Union } supposed	100	Tye River	500
Deans }		Union	75
	28757 hhds.		57958

REARING HOGS.

From the Farmers' Cabinet.

Mr. Editor,—I wish to add my testimony to that of "Siam," at page 42 of the Cabinet for August: I have never been able to rear the first litter of pigs from a young sow with credit to myself, or profit to any one, and it is now my practice to kill them for roasters, rather than make another attempt. I have, however, seen some who have been more fortunate, but, as a general rule, I believe the thing, as I have stated it, is well established; and in a paper, which I have now before me, "The Carolina Planter," I find the following observation.

"It is a fact of common observation, with even

our old servants who have long been hog-minders, that the first litter of pigs from a young sow, or, as they call them, *gilt pigs*, are naturally of a feeble constitution and unthrifty, and difficult to raise, and even if raised, never perhaps acquire the size and weight that litters of the same sow do afterwards." And, in addition to this, I would say, I have raised more than twenty calves from young cows—their first calves—and have never failed in obtaining them fine, strong and healthy; nay, if I were to double the number, I should not be beyond the truth. Can any of your readers account for a phenomenon that is so generally accredited, as to have grown into a proverb—"the calf of a young cow, the pig of an old sow."

From the Farmers' Cabinet.

BLOSSOM.

The property of Samuel Canby, Esq. of Woodside, Delaware.

Pedigree—Blossom, roan, calved in 1835; bred by C. H. Hall, Esq., of New York: got by Fox's Regent, dam Leonora, (a great and constant milker, imported by Alderman Ferris of New York,) by a son of Lancaster; g. d. out of Elvira, by Young Phenomenon, and he by Favorite. Fox's Regent, (sire of Blossom, bred by C. H. Hall) was got by Imported Regent, dam Snowdrop, got in England by Fitz Favorite, and the first heifer dropped in America, by Blanche, a great milker, presented by Admiral Sir Isaac Coffin to Mr. Hall.

This remarkable animal (remarkable for her *breeding* as for her *milking*) is a beautiful roan, with a countenance the most gentle that can be conceived. Her capacity for deep milking is observable in the peculiar formation of the udder, and prominent milk-vein, her quiet and peaceable disposition tending greatly to the secretion of that flow of milk, which has never ceased since the day of her first calving, which was on the 5th of April, 1838. On the 4th of July she brought twins, *Liberty* and *Independence*, and on the 16th of May, 1840, she had twins the second time! These were named *Romeo* and *Juliet*. Thus has this wonderful animal brought forth *five* living calves in the space of twenty-five months! Her milk has averaged twenty quarts per day during the whole of this time, and with her first calf she gave twenty-five quarts per day, making nearly twelve pounds of butter per week. Such constant draining has justly been considered unfavorable to health and bodily strength, and for this reason she has never carried much flesh; but it has been impossible to dry her milk, even for a few days before calving, although she has been kept from grass for that purpose: her condition, however, is generally good, and she shows great vigor and sprightliness. She is again in calf, by the imported bull Washington Irving, and her time is calculated for the month of March. Her first calf *Delaware*, took the first premium at the late exhibition of the Delaware State Agricultural Society, held at Wilmington, as "the best animal raised in the country."

But it is a singular circumstance, that her last twins, *Romeo* and *Juliet*, are white, although her own color is roan, and that is also the color of the bull! This shows that she is breeding back, being herself descended from *Comet*, 155 (1,000 guineas), who was white.

Here follows an account of Blossom's yield of milk for one week:

	MORNING.	NOON.	EVENING.	TOTAL.
June 13,	12 quarts	11¼	11¼	34½
" 14,	12¼	11¼	11	34½
" 15,	12½	11	11½	35
" 16,	12¼	12½	11	36
" 17,	12¼	11½	11	35
" 18,	13	12	11½	36½
" 19,	13½	11½	11	36
Total,				247½

Being on an average over thirty-five quarts per day, yielding 13¼ lbs. of well-worked butter, one month from the time of her calving.

From the Journal of Commerce.

A KINGDOM EMBANKED FROM THE SEA.

Rotterdam, (Holland,) Sept. 25, 1840.

It certainly strikes an American as very singular that a country—a whole kingdom—should actually be lower than the sea; yet such is the case with Holland. Nothing but the dikes, and sand hills on the coast (called Dunes), keep it from being submerged. Thus every river and creek is followed up in all its wanderings and ramifications, each side carefully diked up—canals, outlets, sluices, dams, and docks placed wherever required, and thus, the whole kingdom is garrisoned as it were, requiring constantly a large body of engineers at every part to watch and guard against the invasion of their subtle enemy (the water) which is unceasingly wearing and washing away the embankments, requiring instant and energetic measures for repairing what injury may be sustained, and preventing their foe from overspreading the country. Much of the land has been reclaimed from the water. The lake of Haarlem, 28 miles in circumference, averaging 6 feet of water and 8 feet mud, the washings of the Rhine, was once land, and they have now commenced draining it, to make it land again, which will take about 6 years. Part of the immense number of windmills seen here, are used for the purpose of drawing off water from the land and pumping it into canals that lead finally into the sea. You can stand on a dike, and see four or more levels of water, all within a few feet of each other. They have few fences, the houses in the country being surrounded by little canals, with bridges, over which are gates which are of course a protection against intruders. Many have small turning bridges, turning on a pivot placed on the house side, so that when you pass over, a small jerk with the foot, places the bridge your side of the canal, and prevents ingress from the opposite bank. In Amsterdam there are from 280 to 300 bridges through the city. It is surrounded by a fosse 80 feet wide, its walls are demolished, but it has 26 bastions, converted into corn mills, and is entered by 8 gates, (poortes). It is built in the form of a half circle on the Y. The Amstel river enters the city, S. E. side, and its waters are then conducted round and through the city, communicating with the Y, which flows into the Zuider Zee. There is a ship canal through

to the sea. The city is about nine miles in circumference. It stands entirely on piles, driven in the mud—has about 27,000 houses, over 200,000 inhabitants, 22,000 of whom are Jews. The Royal Palace is a grand building, 282 feet long, 222 feet deep, 116 feet high, without the Tower, which is 67 feet high. The building stands on 13,695 piles. The view from the Tower is grand beyond description. The city at your feet, the Zuider Zee, Lake of Haarlem, shipping, windmills, canals, bridges, trees, houses, town and villages in the distance, presenting at one view, in a few words, a little of every thing.

SIBERIAN LIFE ON THE KOLYMA.

From Wrangel's Survey of the North-East coast of Siberia.

To form a just conception of life on the banks of the Kolyma, one must have spent some time with the inhabitants. One must have seen them in their winter dwellings and in their summer *balagans;* one must have shot down their rapid streams in the light canoe, must have climbed mountains and rocks with them, or dashed in their light dog-drawn sledges through the most piercing cold over the boundless tundra; one must in short have become one of themselves. Such was our life during the three years we spent here. We lived with them, dressed like them, fed on their dried fish, and shared with them the hardships and privations inseparable from the climate, and the frequent want even of food which it brings along with it.

Let us begin with the spring. The fishery forms their most important pursuit; indeed the very existence of the whole population depends upon it. The locality of Nishney-Kolymsk, however, is unfavorable, and the inhabitants are obliged to migrate at this season to more suitable parts of the river. As soon as the winter ceases, they accordingly abandon their dwellings in search of some convenient spot, where they forthwith construct a *balagan*, or light summer hut, and immediately commence their hostilities upon the piscatory tribe. Most of the Nishney-Kolymskites have regular country-houses of this description at the mouths of the several creeks and rivulets, which they begin to visit in April, in order to prepare for the campaign. In the middle of May, when the merchants arrive from the fair of Ostrownoye, on their return to Yakoutsk, the whole population abandons the little place, leaving the whole town to the guardianship of one Cossack sentinel, and perhaps one or two old women, whom age prevents from joining in the general pursuit.

"Spring is the most trying season of the whole year. The store collected during the summer and autumn has usually been consumed for some time; the fish do not always make their appearance immediately, and the dogs, exhausted by their winter work, and yet more by the severe fast to which they have for some time been subjected, are too feeble to allow their masters to avail themselves of the *nast*,* to catch a few elks and wild reindeer. Famine then appears in its most horrible form. Crowds of Tungusians and Yukaheers come flocking into the Russian villages in search of some subsistence. Pale and ghost-like, they stagger about and greedily devour every species of garbage that falls in their way. Bones, skins, thongs of leather, every thing in short that the stomach will receive is eagerly converted into food. But small is the relief they find; for the unthrifty townspeople are by this time almost as ill off themselves, and living upon the scanty remnant of fodder stored up for the use of the dogs, so that many of these faithful and valuable animals perish nearly every year of hunger. There is a storehouse established by the government, where rye-flour is sold to every comer; but the expense of conveying it from so enormous a distance enhances the price to such a degree that few are able to avail themselves of the facility thus afforded them. Although the additional accommodation is granted them of not paying before autumn, still there are not many who can afford to give twenty rubles for a pood of flour which moreover has often been damaged during the protracted journey it has had to perform. Three of these periods of horror did I witness, during three succeeding springs, and even now I shudder when I reflect on the scenes of suffering which I beheld, and of which it would be utterly impossible for me to attempt a description.

It is just when famine is at its worst that relief arrives. Suddenly countless swarms of birds make their appearance. Swans, geese, ducks and several descriptions of snipes. These are the first heralds of spring, and at their coming hunger and want are at an end. Old and young, men and women, all that can walk or run, now rush out with guns, bows, and sticks, to kill as many as they may. In June the ice breaks up, a profusion of fish comes crowding into the river, and all hands are in movement to avail themselves of the short season of grace to provide a store for the coming year. But here a new misfortune often assails them. The stream is not strong enough to float away with sufficient rapidity the mighty mass of ice. These accumulate in the narrows and shoals, and the water, arrested in its course, quickly overflows the whole of the low country, and, if the inhabitants are not quick enough in driving their horses to the hills, the poor animals are infallibly lost. In the summer of 1822 we had such an inundation at Nishney-Kolymsk, which came upon us so suddenly that we had only just time to take refuge with a few of our most indispensable articles upon the flat roofs of our huts, where we were forced to remain for upwards of a week. The water rushed with fearful rapidity between the houses, and the whole place looked like a little archipelago of house-tops, among which the inhabitants were merrily rowing about in their canoes, paying one another friendly visits and catching fish.

"More or less these inundations occur every year, and when the water subsides the main fishery with nets begins. Fish form the chief food of man

* When the warmth of the spring sun thaws the surface of the snow, it freezes again during the night, whereby a thin crust of ice is formed, strong enough to bear a sledge with its team of dogs. In this condition the snow is called *nast*, over which the elks and reindeer are pursued during the night, and as, owing to their greater weight, they are constantly breaking through the ice, they are caught by the hunters with little trouble.

and dog, and for the yearly consumption of the hundred families that compose the little community of Nishney-Kolymsk, at least three millions of herrings are required. Many other kinds of fish are caught at this time, among which is the *Nelma*, a large description of salmon trout, but the first fish are generally thin, and are mostly converted into *yukhala* for the dogs; that is to say, cut open, cleaned, and dried in the air. From the entrails an abundance of train oil is obtained, which is used for food as well as for fuel. The *yukola* is distinguished from the *yukhala* merely by the selection of a better kind of fish, and by greater care in the preparation.

"The proper season for bird hunting is when the animals are moulting, when having lost their feathers they are unable to fly. Large detachments are then sent off from the fishing stations, and numbers of swans and geese are killed with guns, bows, and sticks. The produce of this chase is said to have diminished greatly of late years. Formerly it was no unusual thing for the hunters to bring home several thousands of geese in one day, whereas now they are content if they can catch as many during the whole season.

"While the men are fishing and hunting, the women make the best use of the interval of fine weather to collect the scanty harvest which the vegetable kingdom yields them, in the shape of a few berries and aromatic herbs. The gathering in of the berries is a season of gaiety, like the vintage in southern climes. The young women wander about in large parties, spending the nights in the open air, and amusing themselves with song and dance, and other innocent diversions. The berries themselves are preserved by pouring cold water over them, and freezing them, in which condition they form one of the favourite dainties during the winter. Besides the berries, they collect at this time the *makarsha*, a mealy root found in large quantities in the subterranean store-houses of the field-mice. The young girls appear to have a peculiar tact in discovering the magazines of these little notable animals, whom, without the least remorse, they plunder of the fruits of their provident industry."

METHOD FOR RETARDING THE HATCHING OF SILK-WORMS' EGGS IN ICE-HOUSES.

For the Farmers' Register.

The following plan for retarding the hatching of silk-worms' eggs by ice-houses, for successive crops, I have found more successful than any hitherto adopted,* and it is now communicated for publication in the Farmers' Register, for the use of such persons as design making further experiments on the subject. I do not claim originality for the plan in all its features, because it is only a modification of that successfully practised by the Rev. D. V. McLean, of New Jersey, in 1839.

A box is made of strong inch-plank, 15 inches deep, 20 inches long and 20 inches broad. To the bottom of this a *bottomless* box, made of similar plank, 8 inches deep, 9 inches long and 9 inches broad, is nailed. The vacuum between the large and small box is filled with pulverized charcoal, which is confined by nailing pieces of plank to the edges of the small box, and sides of the large one. The eggs are then rolled up in separate packages, of about an ounce each, (always placing a blank sheet over the eggs,) and 5 or 6 of these packages are placed in a square tin canister, of dimensions that will allow its being placed in the small wooden box without difficulty, and in height corresponding with the small wooden box. The top of the canister is then put on in a loose manner, so as not to exclude the air, similar to the plan adopted by retail grocers with their tea-canisters, and it is then placed in the small wooden box. The top is then nailed on the large box, and it is placed in the ice-house, so that the ice will come within three inches of the top. Two holes are bored with a spike gimblet about two inches below the top of the box. The boxes are examined (but not opened) from time to time, that they may be placed in their original position, which will be changed by the melting of the ice.

By this method I retarded the eggs last season, from the 20th of April until the 4th of July, or 74 days after the natural period of hatching.* I have endeavored to describe the plan accurately, because I believe that careless management may lead to disappointment and loss.

The boxes *must not be opened until the eggs are wanted for hatching*, and when once opened the eggs must not be left in the ice-house. The practice of placing large parcels of eggs in a box which is frequently opened in the ice-house is dangerous, and I think has produced many of the failures of the last season.

The eggs of silk-worms, and also of other insects, that will not hatch under ordinary circumstances, until the spring or summer of the following year, pass through a *hibernate* or winter state, and during this period the embryo is *dormant*, quiescent or inactive. If this be not the case, how shall we account for the well known fact, that the vitality of the eggs will be destroyed by subjecting them to a very low temperature after very warm weather in the spring, when eggs of the same kind in all other respects, if placed in the ice-house between the 1st and 10th of February, have hatched well as late as the 4th of July, and even as late as August, and produced healthy worms.

By frequently opening the boxes and introducing the warm air, this state of inaction of the embryo may be disturbed, and, when disturbed, attempts to retard its progress, *unnaturally*, will either destroy vitality, or if the worms emerge from the eggs they will drag out a feeble existence, and nearly all die before they are ready to form cocoons. It is well known to all persons familiar with the hatching of silk-worms' eggs, that a *gra-*

* In boxes similar to those described I have retarded the eggs, by burying them under ground until the middle of June. These eggs hatched well and produced very healthy worms. But before a minute description of this method is published, I wish to subject it to the test of further experiments.

* These eggs were placed in the ice-house on the 10th of February, but the 1st of February is full late, and if delayed much beyond that period, it may be found impracticable to retard the hatching without injury to the eggs. The natural period for hatching in latitude 38°, was the 20th of April. This was proved by leaving eggs exposed during the whole of the preceding winter.

dual change takes place a few days before the worms make their appearance, which is manifested by changes in the color of the eggs.

The use of charcoal I consider very important. It absorbs the water proceeding from the melting ice, and also prevents either a sudden *rise* or *fall* of temperature. For this opinion we have scientific authority of high respectability.

"Charcoal by long exposure to the atmosphere absorbs one-twentieth of its weight, three-fourths of which are water." * * * *

"Charcoal is a very slow conductor of caloric. The experiments of Guyton have determined that caloric is conveyed through charcoal more slowly than through sand, in the proportion of three to two. Hence powdered charcoal may be advantageously employed, to surround substances which are to be kept cool in a warm atmosphere; and also to confine the caloric of heated bodies."—(*Henry's Elements of Chemistry*, vol. i., p. 275.)

My experience accords substantially with these views. When charcoal has been used the papers containing the eggs have uniformly come out *dry*, but when dispensed with, they have as uniformly come out *damp*, and in some instances even *wet*.

LAYTON Y. ATKINS.

Stafford Co., Va., November, 1840.

P. S. The space between the top of the *large* box and the canister containing the eggs is not filled with charcoal or any other substance, but is left empty, in order that a *gradual* renewal of the air may take place.

KENTUCKY BLUE-GRASS.

To the Editor of the Farmers' Register.

Frankfort, Ky., Oct. 22, 1840.

Dear Sir:—I observed the inquiry of "a Farmer" in your September number, in reference to Kentucky blue-grass, and your request for information from Judge Kennedy, of Tennessee, or myself. You are perfectly correct, in supposing that Kentucky blue-grass is *not* the same grass known by the same name in Virginia. I have heard many Virginians denounce, like yourself, the blue-grass of your state, as an abominable pest of the corn-field. I have no personal acquaintance with the plant. A native of the Old Dominion had the goodness to bring out a box of it for me, but it never come to hand. Perhaps I ought to be thankful, and probably you will congratulate me, on the failure of the conveyance. Another Virginian threatened, if it arrived, to have me indicted for the introduction of a horrible nuisance.

The blue-grass of Kentucky, which is the predominant grass of our unrivalled pastures, is the *poa pratensis* of botanists; not the *poa compressa* described in England by the popular name of blue-grass. *Our* blue-grass has many synonyms —green-sward, spear-grass, June-grass, yard-grass, great or smooth stalked meadow grass, &c.

The following description is from the Gardener's Dictionary:

"*Poa pratensis—smooth stalked or great meadow-grass—panicle* diffused, spikelets four flowered, glumes lanceolate, five nerved, connected by a villus, stipule abbreviated, blunt; root perennial, creeping by *runners*, easily penetrating into the earth and crevices of walls. Culm *upright*, smooth, scarce perceptibly striated, a foot or eighteen inches [*in Kentucky often three feet*] in height. Leaves smooth, of a dark green color, sometimes glaucous or bluish, heeled, bluntish, spreading. *Sheathes*, the length of the leaves, striated, smooth. *Stipulas, short, blunt. Panicle* elongated, upright, very much branched, rugged; branches alternately decompounded, when in flower spreading horizontally. Spikelets smaller than those of the *poa compressa*, oval, four flowered, often five, sometimes only two flowered, flattened on each side, green or sometimes purple. Calycine glumes sharp, rugged on the back, a little unequal, three nerved. Florets bluntish, five nerved, scaricose at the tip, rugged on the back, connected at the base by numerous very long complicated villose hairs, the inner valves somewhat pubescent at the edge. Filaments longer than the glumes, anthers forked at each end. Styles branched to the bottom. Nectary, two little glumes at the base of the germ; seed angular pointed."

You will be able to judge, from this description, whether the resemblance of the two grasses extends beyond that of their popular names. It is certainly a very great inconvenience that the popular nomenclature of the grasses is so confused and contradictory; and he who shall write a botanic description of them, appending all the popular names given to each species, in such a manner as to enable the reader to distinguish them readily, will have performed a very useful and acceptable service to the agricultural community.

I cannot venture to say whether it would be advisable to sow blue-grass on your marled lands, with the view of smothering or destroying that great pest, wire grass. I can only offer conjectural opinions. It delights in calcareous soils; and I am not confident that sowing it on silicious soils would not prove an utter failure. I am informed of only two experiments made with it in the silicious soils of Kentucky, outside the great limestone region. One of them, in the eastern part of the state, was a sad failure, the grass refusing to form a close turf and only showing itself in occasional tussocks or tufts. The other, in the south-eastern part of the state, was reported as highly successful, but although the accounts represented the soil as wholly silicious and did not state the presence of lime. I cannot but believe it contained some portion of calcareous earth. I have no reasonable grounds of doubt that, on your thoroughly marled lands, Kentucky blue-grass would succeed well. But the entire success of the experiment, I imagine, would depend, in no small degree, on the thorough spreading and incorporation of the marl or other calcareous matter employed. Otherwise, I should fear the grass would not form an entire covering of close turf. In our pastures, blue-grass extirpates wire grass, and, indeed, ultimately expels every other plant, and maintains the occupancy. I know nothing that can maintain a long and vigorous existence with it, except iron-weeds or devil's bit, a tall weed which infests our pastures, and which probably some of our farmers would be willing to swop even for *your* blue-grass.

I am favored with a letter from a Virginia friend, for the last ten years a resident and practical farmer in Kentucky, no less distinguished by his

knowledge and love of agricultural subjects than his literary eminence; from which I will give an extract, more satisfactory, probably, than any thing I could say. From his long residence in both states, his opinions are entitled to much weight; and they favor the conclusion that our blue-grass may be successfully cultivated in Virginia.

"Blue-grass, so called in Virginia, is not the grass called blue-grass in Kentucky. The Kentucky blue-grass is well known in Virginia as the *yard grass* or *greensward*. Its root cespitose, its flower stalk erect like the wheat stalk, its leaves really *green*. The Virginia blue-grass has a system of hard wiry roots, its stalks recumbent and bent at the joints or internodes, and woody, tough and elastic, and its color is cerulean, or *blue*. Both belong to the *poa* genus. Almost every gentleman's yard in old Virginia is set with what is called Kentucky blue-grass. The greensward, yard grass, or Kentucky blue-grass, will grow on any rich loam, but delights in a rich calcareous aluminous soil. It will grow well on marled lands of aluminous earth made rich with vegetable matter of any kind except the leaves of the more astringent vegetables, such as the oak, &c. The decayed leaves of the black walnut and black locust are its favorite food. Hence it grows well even in the shade of these trees. Lands made sufficiently rich to produce these trees planted in them, and marled and sown with the seeds of the green-sward, will in a few years exhibit the appearance of Kentucky woodland pastures, allowance being made for the difference in fertility."

If it be deemed important or desirable to introduce a system of permanent pasturage in old Virginia, and if it shall be demonstrated that marling will render your lands capable of producing Kentucky blue-grass in perfection, and at the same time so compact as to bear the hoof, you will have rendered an *additional* service to your state and country, by the publication of the 'Essay on Calcareous Manures,' scarcely less important than Townsend did to England by the introduction of the turnip. Blue-grass here bears somewhat the same relation to a thrifty and profitable economy, and the improvement of the soil, that roots do to the system of improvement and profit in other countries.

I have said nothing upon the modes of setting lands in blue-grass and of pasturing them, as I do not understand your inquiries to extend to those subjects. If, however, such information, (or any other in reference to our rural practice,) shall be deemed useful to the readers of the Farmers' Register, it will give me pleasure to communicate promptly, on request, any in my possession.

Your correspondent, having never seen a blue-grass pasture, well set, has a great enjoyment in the future. The sight of one of our glorious pastures is a thousand times better worth a journey to see than the Natural Bridge of your state. I should be glad to see more Virginians visiting among us; and would indeed be peculiarly happy to accompany Mr. Ruffin in a delightful round to the farms of our principal graziers—"fine old English gentlemen"—who would be equally glad to see him. Very truly,

THO. B. STEVENSON.

We are not less gratified with the contents of the foregoing communication, than thankful to the writer for his having so promptly responded to our call on this subject, in No. 9. We shall be still further gratified, and some of our readers benefited, by an additional communication, on the best mode of setting land in Kentucky "blue-grass," or what we have known as green-sward. On not only that, but on *any* agricultural subject, we shall always be glad to be indebted to the pen of our present correspondent. And we cannot but be surprised, that *he* should have had the slightest doubt (as expressed in his private postscript,) of such aid from him being desirable and valuable. As a reader of the Farmers' Register, he has known our earnest and often expressed solicitude to obtain articles conveying practical information, from every authentic source, no matter how humble the qualifications of the pensman; and he, as the late editor of the Franklin Farmer, one of the best conducted agricultural journals of the United States, had reason to know, by our selections, the value we attached to his writings and to his editorial judgment.

There is no doubt but that the valuable grass which he describes *will* grow well on our marled lands, even when the soil is so silicious as to deserve the term of *sandy loam;* and on which not a trace of this grass could have been found, or induced to grow, before marling. We have never known the seed to be sown, (or any to be offered for sale in Virginia,) and, except in old yards and garden grass-plots, have never known green-sward to have complete possession of the land. But wherever we have marled, even on very poor land, this grass soon began to stand in small spots of a few feet, or at most but a few yards across; and in so many places as to oppose considerable difficulty to tillage; though not to compare with the wire-grass (the English couch-grass,) of which marl still more favors the growth on dry, sandy soils, and the Virginian blue-grass on clay and moist soils. The green-sward, when forming a close sod, of unmixed growth, would not be difficult to plough under—if desirable to destroy such valuable pasture—but when in small tussocks, it is pushed forward or aside by the plough, instead of being subverted, and is therefore more difficult to be managed under a tillage crop.

We trust that some of our several readers, who possess enough botanical knowledge for the purpose, will contribute to effect the object suggested by Mr. Stevenson in regard to the forming a convenient and correct nomenclature of American grasses, so as to get rid of the intolerable confusion which exists, in consequence of different vulgar or provincial names being in many cases used for the same grass—in other cases, the same name being used for different grasses—and

in others, the common name of a well known grass of one region being given to a different grass in another region. What is wanting, is not only to give the botanical name and character and scientific description of each grass, but also a description suited to those persons who have no botanical knowledge—and a list of all the vulgar names known, and their several localities. The preparation of such a descriptive list of grasses, or even the furnishing of any materials for such a one, will be a valuable aid to agricultural improvement.

QUESTIONS AND SUGGESTIONS.

For the Farmers' Register.

"Gentlemen, we have met according to notice, and I hope we can all take time to have a chat on farming. But before we begin, I will tell you that I am a very inquisitive fellow and may hurt some of your feelings; but as my object is improvement, I hope none of you will take insult until your works have been weighed in the balance.

"Mr. A., where do you live, and what do you follow?"

"I reside near James River, in the neighborhood of a mill, where I can always get the best price for wheat. My ground, although of medium quality, is well adapted to this grain; and the carriage costing me but little, I make it my principal crop, and find it profitable. I have four or five fields, and crop each in rotation, by which method I am enabled to go ahead with but little manure; indeed, as I keep but few cattle, I can make but little manure."

"Permit me to ask, if your cross fences are not very expensive, and if bushes, briers and weeds do not pester you?"

"I answer all in the affirmative; but what better can I do?"

"One more question, and I am done with you for the present. What think you of only three fields, thus extending the space for the action of the plough, spreading manure and harvesting from the greater and better portions, and turning under a green crop of oats, rye, peas, Indian corn, buckwheat, or the like, on that which is poor?"

"I must confess this looks more like pulverizing the ground, destroying the pests and bringing my fields to uniformity of character."

"Mr. B., where is your residence, and what your occupation?"

"I live in the big mountains, about sixty miles from market, and make wheat and tobacco for sale."

"How much does it cost you to get your crops to market?"

"I do not exactly know, but when the purchaser and carrier are done with me, I have but little left."

"By keeping your steep grounds in constant cultivation, does it not wash into gullies?"

"What is that to you."

"Mr. C., where is your residence and what your business?"

"I am neighbor to Mr. B., and raise and fatten stock for market."

"What does it cost you to carry to market?"

"Not much; for as we all start on foot and in good plight, we have no shattering and breaking down on the way."

"Are your lands improving?"

"Yes, they are nearly as rich as heart could wish."

"May I ask you a few more questions?"

"O yes, just as many as you please."

"Then as you are so affable I will only ask you one, which may answer all my purpose—how do you manage your domestic matters?"

"I have an extensive mountain field, on which my sheep graze about eight months, and my cattle about six months in the year. My bottom lands are cultivated in Indian corn, rye, root vegetables and hay meadow. My hills are appropriated to rye, oats and grazing grass. Through the winter my cattle are secured in a neat yard, for making manure; and my sheep run on the grass and rye. I have only two fields on my bottoms from which I harvest grain, these being in corn and rye alternately. The partition of these fields is immediately at the cow yard and horse stable; so that the manure is moved with the least possible expense and damage. One field is manured and planted in corn, at the last working of which rye is sown, and the next year the other is managed in the same way. When the rye is harvested from the first mentioned, it is immediately ploughed again and resowed with rye; the remains of which are turned under in spring in preparation for corn; thus in two years I take from either field a crop of corn, a crop of rye, and have good grazing both winters. By means of canals and conduits, I water my corn and rye as required, in the months of August and September; and from sufficient experience, I know, that although corn will not bear much water when young, yet when beginning to silk and tassel, and afterward, it cannot easily be saturated, nor indeed can young rye; nevertheless it is best, particularly on clay, to divert the water at intervals, so the earth and roots may take breath."

"Mr. D., what is your occupation, and where do you live?"

"I will tell you when I get a drink of grog." (*exit.*)

"Gentlemen, can one of you tell me who this Mr. D. is?"

"He is a good kind of a good for nothing creature, who makes a business of lurking about the grog-shops, thus spending his money, and time, while his wife and children are suffering."

"Mr. E., I am happy in making you known to this company as a scientific and industrious farmer; be so obliging as to give us a full history of your works?"

"I did not come here for the purpose of making communications; my neighbors call me Klyogg, and like him I intend to live and die."

"But do you not know that for his selfishness, the great Klyogg died heavily laden with contempt?"

"Mr. F., give us a history of your affairs?"

"With cheerfulness I will, particularly for the edification of Mr. E. **********."

"Mr. G., where do you reside, and how do you manage?"

"I am located in middle Virginia, and have abundant space for operations. I keep more horses than laborers, and my ploughs never stop except

for wet weather and ice. I hire only at harvest, and gather abundance. By much ploughing I have no need of either grubbing hoe or weeding hoe. My fences are substantial, consequently my crops are safe. The poorer my gound, the deeper I ploughed, and although the consequence was neither as sudden nor wonderful as calling Lazarus from the grave, yet it was equally certain. I keep only a few milch cows and hogs, and sheep for my own purpose."

"I am informed, Mr. G., that your neighbors are in the habit of calling you Sweepstakes; please tell us why so?"

"I dare not say I know the reason; and if I did, it would be improper in me to tell it."

"Mr. H., I know that your residence is in the limestone valley, therefore please tell us something of your operations?"

"Our lands are generally equally well adapted to wheat, rye, oats, red-clover and all other common grasses. We do not make very much Indian corn, nor is our soil and climate so well adapted to this grain as the eastern side of the Blue Ridge; but the quality of all our grains is superior. We raise some stock for market, and every kind appears to thrive equally well. We have meadows yielding from one to four tons of hay to the acre, which are generally watered, and otherwise pretty well managed. We have vast beds of marl, which when cultivated yield astonishing crops, which is sufficient evidence of their virtue; but so far as I am informed no one has removed and spread any as a manure. We are a healthy, hardy, industrious people, and manage our matters to suit ourselves."

"Mr. J., I am glad to see you here too, please tell us how your matters come on?"

"O yes, I am here too, but as to your disquisitions and book farming matters, I don't believe in them."

"Mr. K., please give us a short sketch before we part?"

"I live in the broom-straw country, and can tell you about its management. The Yankees say it only grows in exhausted fields; but in old Virginia it is not so. It is true that the sedge grows only on poor grounds, but it is found on mountains and valleys, both new and old. On rich ground, I have seen the broom five to six feet high, and so stout that four able horses in a plough could not turn it under. It is a great pest amongst my artificial grasses, but when once I get a good sod of natural grass, I defy it. I once destroyed this pest in a pasture field by running a coulter through it in the fall and winter. When a broom field is about to be brought into cultivation, it is best to fallow and harrow in a crop of rye or oats; the year after, the sod will be rotten and ready for any other crop."

"Gentlemen, bed time has come, and we must part; if ever we meet again, I hope we shall be more advanced in our business; but if you think this (our first effort) is worthless, I shall call a meeting no more." INVESTIGATOR.

November, 1840.

COTTON IN INDIA.

From the American Farmer.

We again call attention to the importance of the movement now making by several powerful interests in England, to secure a rivalry to our great staple in the market of that kingdom, and, as before remarked, we feel satisfied, from the vastness of the interests involved, and the jealousy that exists towards the institutions of our country, that every means will be put in requisition to secure the accomplishment of the object in view. The operating interests involved in the experiment may be classed under three heads, either of which, in their separate capacity, might be considered formidable. They are—

1st.—The interest of the government of Great Britain to secure a supply of cotton for their extensive manufactories, in case of a rupture with this country.

2d.—The interest of the powerful East India Company, to increase their commercial gains, already enormously great, and to add to the value of their possessions in that vast region, now under their almost unlimited control. And,

3dly.—The influence of the abolitionists in England, to gratify their antipathy to the slave-holding interests of these states.

The mere enumeration of these powerful interests are sufficient to induce the conviction that a most strenuous exertion will be made, and if talent, zeal, and money will accomplish the object, there is no doubt it will be obtained.

With regard to the 1st division of the subject, we would remark,—that the government of Great Britain has ever maintained a jealousy toward commercial nations. England prides herself on the idea of being the mistress of the ocean, and she guards those interests connected with her trade and commerce with unceasing vigilance. She never loses sight of advantages to be gained therein, knowing as she does that her prosperity is vitally identified with her commerce. The United States is, or bids fair to be her greatest rival, and in the course of time it is not to be expected that collisions will not take place between two powers, each contending for the supremacy, each jealous of their honor, and each confident in their might. Under such circumstances, England feels herself hampered by her dependence upon us for our main staple, so necessary at this time to keep her spindles in operation; but her history and all experience teaches, that she will not remain in this state of dependence longer than she can find a way for her escape therefrom; consequently every inducement may be naturally expected and held out by her in releasing herself from her present position—for, disguise it as she will, she is in a measure in commercial bondage to this country, which will, so long as it lasts, cause her to be wary in provoking a controversy with us, except in the utmost resort.

2dly.—The overgrown power and possessions of the East India Company will naturally induce them to desire to extend their trade and resources; and there has sprung up a rivalry in England by the establishment of a new company, having this very object in view, which will induce them to use their vast resources and illimitable means, to accomplish (if the thing is attainable) the

point now aimed at. The N. Y. Journal of Commerce gives an abstract from and makes some remarks upon the report made to the East India Company on this subject, from which we extract the following, and leave this branch of the subject:—

"The special report of the directors of the Chamber goes on to state that "it appears to be a very judicious arrangement which the Hon. East India Company has adopted, viz: to send over to India, with the machines, several talented and experienced gentlemen, natives of the United States of America, and brought up as cotton planters, who will be able to give a new impulse to the growth of cotton in India, and to devise and carry into effect the best methods of driving the saw-gin, and applying that machine to the very important purpose of cleaning the cotton so produced."

"The vital importance of the American saw-gins will be seen at once when you remember that with one of these machines 1100 lbs. to 1200 lbs. weight of clean cotton can be produced per day, whilst the machine used in India, the Chinka, can only prepare from 38 lbs. to 40 lbs. per day. The machine, also, that has been invented by Messrs. Fawcett & Co. is stated to be even a decided improvement upon the American saw-gin, so that every opportunity is now given to the growers of cotton in India, to compete with the American market. The planters who have been engaged from the United States are so engaged for five years, and their experiments are to be carried out on a most extensive scale. There can be no doubt that with such a wealthy body as the Lords of Leadenhall street—the East India Company—to back and support them through all their endeavors, something will now be done."

3dly.—The influence and zeal which the abolitionists of England have evinced, are too well known—the British West India colonies are a proof before our eyes of the fact—and it is equally well understood, (for their movements have been open and above board) that they are determined to take the peculiar interests of our southern states into their especial care and keeping, We will not at this time extend our remarks upon this branch of the subject, farther than to introduce some from the journal above quoted, which comprises the pith and marrow of all that is necessary to be said thereon, and which we especially commend to our southern friends:—

"Bearing upon this subject, though partially, is the meeting held on the 27th at Manchester for establishing "The Northern Central British India Society." The celebrated Mr. George Thompson has been instrumental in getting up the steam on this occasion, and "Charles Lennox Redmond, a gentleman of color, Anti-slavery debater from Pennsylvania," was paraded upon the platform. The chairman declared that the object of the meeting was to aim a deadly blow at slavery, and to transfer our market from the slave grower of cotton in America, to the free grower of British India. The principal speakers were Mr. Thompson and Mr. O'Connell, and the latter came from Ireland expressly to attend the meeting. Mr. Thompson declared that there was no measure so calculated to effect the downfal of slavery in the United States, as by encouraging the growth of cotton by free labor. He instanced the superior cheapness of free labor over slave labor by the cultivation of indigo. Fifty years ago it was wholly supplied by slave labor, but now the slave grown indigo of the Carolinas and South America, has been superseded, and the three millions of it which they imported into Europe has dwindled beneath an ounce.

In allusion to the part taken by the East India Company, which I have above described, Mr. T. declared that it was an event in history that could not be matched for 200 years. Mr. O'Connell's speech was particularly remarkable, for it did not contain one single sentence of abuse against the south. It was confined entirely to a description of the atrocious tyranny exercised over India by the Company, and demonstrating the miseries, privations, famines, and death, which have been the melancholy consequences of their iron rule."

COMPETITION OF EAST INDIA COTTON WITH AMERICAN COTTON.

[From the Boston Daily Advertiser.

The increasing magnitude of the trade between India and Great Britain, and its importance to the latter country as a great and growing market for her manufactures, is a subject of discussion which has become very interesting to the British nation, as it also should be to us, for its bearing on the future demand and value for our great staple—cotton. The ground taken by many intelligent persons in India and in England, who have taken great pains to become acquainted with all the facts in the case, is *that the natural capabilities of British India for the production of raw cotton will enable her planters and merchants to supply the consumption of England lower than the produce of any other country.*

In accordance with this view of the matter, exertions have been made to extend the cultivation and improve the qualities of the India product by cotton importations of seed from this country and all other growing countries, and by inducing planters of experience and skill in the management of its cultivation, to go from this country to various parts of India, where some of them have arrived, and are now engaged in that object.

To aid in these designs—of the Indian Government and Indian planters—the merchants and manufacturers in Great Britain have held various meetings and formed associations, and the reports of their proceedings have been published in the leading journals of England with great commendation of the zeal and enterprise of those concerned in this important undertaking, and for the most part participating in the sanguine expectations of the East Indians, in the opinion set forth by them of their ability to "render it"—to use their own terms—"*unnecessary for England to have recourse to America or to any other foreign market, for the supply of cotton which she needs.*"

If England expects to receive her whole supply of cotton from India there must be a rapid and great extension of its cultivation in that quarter. The import of cotton into Great Britain for several years is as follows:

	From U. S. POUNDS.	From E. Indies. POUNDS.	From all parts. POUNDS.
1835	283,000,000	44,000,000	369,000,000
1836	281,000,000	79,500,000	404,000,000
1837	314,000,000	52,000,000	403,000,000
1838	417,000,000	38,000,000	497,000,000
1839	304,500,000	47,000,000	388,000,000

The export of cotton of this year's crop to Great Britain, amounts to 1,209,000 bales and before the season closes it may reach 1,240,000 bales, of 375 lbs., equal to 465,000,000 lbs.

The imports of Indian cotton into England will be larger than last year, owing principally to the interruption of the cotton trade between that coun-

try and China. Usually India sends to China about 50 or 60,000,000 lbs; a portion of this will no doubt go to England, superadded to what would otherwise be sent there—perhaps 60,000,000 lbs.

If then we take the aggregate importation of American and East India cottons into Great Britain for six years, they will amount to 2,064,500,000 lbs. of the former, against 320,500,000 of the latter. The average for six years of the East India will be 15½ per cent. on the American. A quantity not more than equal to the consumption of the factories in Massachusetts, Rhode Island and Maine.

The question as to which country can produce this staple at the lowest price, is a very important one to these states. Thus far the facts and the inferences which may be reasonably drawn from them, are in our favor, as will be apparent by the following statements.

The largest importation of India cotton into England took place in 1818, under the stimulus of extreme prices which ranged through the years of 1817 and 1818 in the Liverpool market, 8*d.* to 16*d.* per pound equal to 16 and 32 cents per lb. for Surat and Bengal; and for American Uplands 16*d.* to 22*d.* equal to 32 and 44 cents per lb.

The imports from India to Great Britain in 1817 amounted to 117,252 bales—increased in 1819 to 242,090 bales, of 300 lbs. each, equal to 72,637,000 lbs.—against an importation in Great Britain from the United States of 216,500 bales of 240 lbs. as rated in England. Thus it would appear that in 1818 the quantity of East India cotton imported into England was 72,627,000 lbs., against 51,965,000 from the United States. The whole imports of cotton in Great Britain in 1818 amounted to 173,940,000 lbs., of which were consumed 111,800,000 lbs.—a quantity, probably, somewhat above the existing consumption of the United States, while that of Great Britain extended to 401,975,121, the average of 1838 and 1839, and it may somewhat exceed these figures the current year.

When prices of this staple fell, as they did in a great ratio after 1818, the imports from India rapidly declined, and one year below 20,000 bales, while the imports from the United States, though equally reduced in value, continued to increase. In 1818 the imports of East India cotton to Great Britain were 40 per cent. larger than from the United States. This year the probable quantity of East India imported in Great Britain will be about one eighth of the quantity imported from the United States. On the India importations there will be a loss at the existing prices of at least 30 or 40 per cent. to the importers though shipped at as low or lower prices than have usually been paid for it, while the shipments from this country, it is said by those who are concerned in them, will afford a saving remittance.

These facts will, we think, support the inference to which I referred—namely, that we can undersell the East India cotton grower in the English market; for while their shipments to England have declined, ours have increased in the period of 21 years from 52 millions to 465,000,000 lbs. We have, too, gained in about an equal ratio upon the Brazils, Egypt and West Indies, our other competitors in the production of this staple. In Egypt and the Brazils the crops have decreased the last 20 years while our crops have increased from 138,900,000—the out-turn of the two seasons of 1820 and 1821—to upwards of 900,000,000 lbs. the product of the season now drawing to a close.

But it may be said that the existing low prices are not remunerative to the planter, and consequently the crops will be curtailed. This was the ground taken in the Cotton Circular that appeared some twelve months since, under the signatures of Mr. McDuffie, Mr. Branch, and other cotton planters. They even complained of insufficient prices and of combinations among merchants and manufacturers to keep them down when the crop had been nearly sold at 12 to 16 cents per lb. The crop of this season has not, we suppose, averaged over 8 cents per lb., and yet the cultivation has not been lessened; nor can any intelligent person familiar with the condition of the cotton states, point out a more profitable employment for lands, labor and capital, than the production of cotton at 8 cents per lb. So far from there having been any reduction of planting, the common opinion is, that a season as favorable as was the last, will yield some 100 or 200,000 bales beyond the crop of 1839-1840, amounting to about 2,140 or 2,150,000 bales. It is not, however, to be expected that the season of growth and for securing the crop will be so extremely favorable as the last, and the most general anticipation at this early day is, that the coming crop will fall short of the last by 2 or 300,000 bales, and if such be the case, taking into view the increased consumption and somewhat decreased stock in Europe—it is thought by many experienced merchants and planters, that the prices of this commodity will range somewhat higher in 1841, than they now are or have been during the current year, provided the peace of the world, and the operations of the manufacturer and merchant shall not be discouraged nor disturbed by wars or the apprehensions of wars. Such a state of things would greatly reduce the consumption of cotton and all other staples of which we have an exportable surplus.

On the whole, though there may be some cause for anxiety as to the interference of India with American cotton, yet we are strongly inclined to a contrary opinion, grounded on some considerable experience as to the results of the experiments in India.

It is an interesting subject to the whole country, and especially to our southern friends, whose free trade principles would not allow them to throw any impediments in the way of the northern manufacturers, should they turn away from their staple to that of India. At present they regard us as unimportant customers—and so we are in comparison with the whole of Europe; but they should bear in mind that New England alone now consumes more than half as much cotton as the whole consumption of England, Scotland and Ireland, 20 years ago: and that, according to the ratio at which consumption has proceeded the last 10 or 12 years, it will be doubled in the course of that period.--The consumption of the whole country may now be 275,000 bales, and in 1852 it will fully reach 500,000. This is predicted chiefly on our home consumption, as we only export about 3 to 4,000,000 of manufactured goods.

If, however, the currency can be kept in a sound state, and commerce and manufacturing remain undisturbed by an inflated currency—necessarily tending to over importations and commercial revulsions—we shall be able to manufac-

ture coarse goods as low, and for some articles lower than in England, and consequently our exports of cotton fabrics may and no doubt will be extended to three or four times their present amount. It is indeed as certain that our natural capabilities, when brought into full action, (which they have not as yet been) to produce heavy coarse cotton fabrics, are as competent to supply this country with nine-tenths of all we want to consume, as they are to transport the products of the country at a lower rate than our European competitors, and this too under any duty which government may think it expedient to impose for the purpose of revenue.

It is equally certain, that in many sorts of coarse goods we can compete successfully in the markets of South America, Asia, and Africa, and in some parts of Europe, with our only rivals the manufacturers of Great Britain. Our failing to do this to a greater, much greater extent than had heretofore been done, is owing to the injurious workings of a vicious currency, and still worse system of managing it, together with that want of accuracy, skill and prudence, which are characteristics of the majority of those concerned in manufacturing. These, however, are, for the most part, evils of a temporary character, and can be and will be overcome, and before this century closes New England may not be far behind Old England in her most important branch of manufacturing.

In regard to the more immediate object of these remarks, namely, the competition of India, with the United States, for the supply of cotton to the English markets, I would refer the reader to an interesting and well written article, in "*Hazard's United States Commercial and Statistical Register*," vol. i., p. 109. It contains the remarks of an able, intelligent writer, under the signature of B., upon a communication in an English Journal—in which latter paper it is contended that India cotton can be so improved in quality and lowered in cost as to undersell the American. The commentator, who appears to be acquainted with his subject, contends to the contrary, and though we think he has reasoned in some respects upon wrong data, yet we concur in the conclusion to which he has arrived.

The work to which we have referred is devoted mainly to statistics. It contains many facts which ought to be familiar to every merchant, mechanic and manufacturer in the country, as having a useful bearing on their pursuits. It will also be a useful book of reference to the legislator and politician, most of whom lessen the benefit of their labors for want of facts. It is, I believe, the only journal in the country devoted to this useful, but, *among us*, much neglected branch of science, and it merits encouragement. INVESTIGATOR.

COTTON TRADE.

From the N. Y. Herald.

The cotton year has closed, after a season of great abundance. The following is a statement of the cotton crop for the year ending September 30, 1840

Cotton crop of the United States, 1839-40.

New Orleans Sept. 26,	960,850	
Less received from Mobile and Florida,		18,376—942,174
Natchez on export to Liverpool and New York,		8,831
Mobile,		446,678
Florida,		128,344
Georgia, September 30,	295,156	
Add export from Darien to New York,		11,070—295,708
South Carolina, September, 30,	318,870	
Less receipts from Georgia and Florida,		7,132—311,738
North Carolina,		9,890
Virginia,		19,000

Total crop	1830-40	bales	2,162,663
"	1838-39	"	1,365,698
"	1837-38	"	1,801,497
"	1836-37	"	1,422,930
"	1835-36	"	1,360,725
"	1834-35	"	1,254,328
"	1833-34	"	1,205,394
"	1832 33	"	1,070,438
"	1831-32	"	987,477
"	1830-31	"	1,038,848
"	1829-30	"	976,845

From this it appears that the cotton crops of the last ten years average 1,367,595 bales. In regard to the growing crop there are as many reports of damage done by floods and worms as ever. In opposition to those reports, however, the weather throughout the cotton sections has, we believe, been unusually good for the season. This fact is a favorable one. The receipts of new crop thus far continue to exceed the receipts at the same time last year. At New Orleans the receipts of new crop are as 24,725 against 13,302 bales last year. At Mobile old cotton is quoted 7 to 9½, and new 9 to 10½. In this market the transactions have been small, at the following rates: Upland, 8¼ to 10¾; New Orleans 10¾; Mobile 8½ to 10¾; Florida, 8¼ to 10¾.

MODE OF LIVING OF THE PRIMITIVE SETTLERS OF THE VALLEY OF VIRGINIA.

From Kercheval's History of the Valley of Virginia.

The first houses erected by the primitive settlers were log cabins, with covers of split clapboards, and weight-poles to keep them in place. They were frequently seen with earthen floors; or if wooden floors were used, they were made of split puncheons, a little smoothed with the broad-axe. These houses were pretty generally in use since the author's recollection. There were, however, a few frame and stone buildings erected previous to the war of the revolution. As the country improved in population and wealth, there was a corresponding improvement in the erection of buildings.

When this improvement commenced, the most general mode of building was with hewn logs, a shingle roof and plank floor, the plank cut out with the whip saw. Before the erection of saw mills, all the plank used in the construction of houses was worked out in this way. As it is probable some of my young readers have never

seen a whip saw, a short description of it may not be uninteresting. It was about the length of the common mill saw, with a handle at each end transversely fixed to it. The timber intended to be sawed was first squared with the broad-axe, and then raised on a scaffold six or seven feet high. Two able-bodied men then took hold of the saw, one standing on the top of the log and the other under it, and commenced sawing. The labor was excessively fatiguing, and about one hundred feet of plank or scantling was considered a good day's work for the two hands. The introduction of saw mills, however, soon superseded the use of the whip saw, but they were not entirely laid aside until several years after the war of the revolution.

The dress of the early settlers was of the plainest materials—generally of their own manufacture; and if a modern "belle" or "beau" were now to witness the extreme plainness and simplicity of their fashions, the one would be thrown into a fit of the hysterics, and the other frightened at the odd and grotesque appearance of their progenitors.

Previous to the war of the revolution, the married men generally shaved their heads, and either wore wigs or white linen caps. When the war commenced, this fashion was laid aside, partly from patriotic considerations, and partly from necessity. Owing to the entire interruption of the intercourse with England, wigs could not easily be obtained, nor white linen for caps.

The men's coats were generally made with broad backs, and straight short skirts, with pockets on the outside having large flaps. The waistcoats had skirts nearly half way down to the knees, and very broad pocket flaps. The breeches were so short as barely to reach the knee, with a band surrounding the knee, fastened with either brass or silver buckles. The stocking was drawn up under the knee-band, and tied with a garter (generally red or blue) below the knee, so as to be seen. The shoes were of coarse leather, with straps to the quarters, and fastened with either brass or silver buckles. The hat was either of wool or fur, with a round crown not exceeding three or four inches high, with a broad brim.* The dress for the neck was usually a narrow collar to the shirt, with a white linen stock drawn together at the ends, on the back of the neck, with a broad metal buckle. The more wealthy and fashionable were sometimes seen with their stock, knee and shoe buckles, set either in gold or silver with brilliant stones. The author can recollect, when a child, if he happened to see any of those finely dressed "great folks," as they were then termed, he felt awed in their presence, and viewed them as something more than man.

The female dress was generally the short-gown and petticoat, made of the plainest materials. The German women mostly wore tight calico caps on their heads, and in the summer season they were generally seen with no other clothing than a linen shift and petticoat—the feet, hands, and arms bare. In hay and harvest time, they joined the men in the labor of the meadow and grain fields. This custom, of the females laboring in the time of harvest, was not exclusively a German practice, but was common to all the northern people. Many females were most expert mowers and reapers. Within the author's recollection, he has seen several female reapers who were equal to the stoutest males in the harvest field. It was no uncommon thing to see the female part of the family at the hoe or the plough; and some of our now wealthiest citizens frequently boast of their grandmothers, ay, mothers too, performing this kind of heavy labor.

The natural result of this kind of rural life was, to produce a hardy and vigorous race of people. It was this race of people who had to meet and breast the various Indian wars and the storms of the revolution.

The Dutchman's barn was usually the best building on his farm. He was sure to erect a fine large barn, before he built any other dwelling-house than his rude log cabin. There were none of our primitive immigrants more uniform in the form of their buildings than the Germans. Their dwelling-houses were seldom raised more than a single story in height, with a large cellar beneath; the chimney in the middle, with a very wide fireplace in one end for the kitchen, in the other end a stove room. Their furniture was of the simplest and plainest kind; and there was always a long pine table fixed in one corner of the stove room, with permanent benches on one side. On the upper floor garners for holding grain were very common. Their beds were generally filled with straw or chaff, with a fine feather bed for covering in the winter. The author has several times slept in this kind of bed; and to a person unaccustomed to it, it is attended not unfrequently with danger to the health. The thick covering of the feathers is pretty certain to produce a profuse perspiration, which an exposure to cold, on rising in the morning, is apt to check suddenly, causing chillness and obstinate cough. The author, a few years ago, caught in this way the most severe cold, which was followed by a long and distressing cough, he ever was afflicted with.

Many of the Germans have what they call a drum, through which the stove pipe passes in their upper rooms. It is made of sheet iron, something in the shape of the military drum. It soon fills with heat from the pipe, by which the rooms become agreeably warm in the coldest weather. A piazza is a very common appendage to a Dutchman's dwelling-house, in which his saddles, and very frequently his wagon or plough harness, are hung up.

The Germans erect stables for their domestic animals of every species: even their swine are housed in the winter season. Their barns and stables are well stored with provender, particularly fine hay: hence their quadrupeds of all kinds are kept throughout the year in the finest possible order. This practice of housing stock in the winter season is unquestionably great economy in husbandry. Much less food is required to sustain them, and the animals come out in the spring in fine health and condition. It is a rare occurrence to hear of a Dutchman's losing any part of his stock with poverty. The practice of housing stock in the winter is not exclusively a German custom, but is common to most of the northern people, and those descended from immigrants from the north. The author recollects once seeing the cow stalls adjoining the farmers' dwelling.

The German women, many of them, are re-

* The Quakers were remarkable for their broad brim hats. They were sometimes called "Broadbrims," by way of distinguishing them from other people.

markably neat housekeepers. There are some of them, however, extremely slovenly, and their dwellings are kept in the worst possible condition. The effluvia arising from this want of cleanliness is in the highest degree disgusting and offensive to persons unaccustomed to such fare. The same remarks are applicable to the Irish; nay to some native Virginians. The Germans are remarkable for their fine bread, milk and butter. They consume in their diet less animal flesh, and of course more vegetables, milk and butter, than most other people. Their "sour krout"* in the winter constitutes a considerable part of their living. They generally consume less, and sell more of the product of their labor, than any other class of citizens. A Dutchman is proverbial for his patient perseverance in his domestic labors. Their farms are generally small and nicely cultivated. In all his agricultural pursuits his meadows demand his greatest care and attention. His little farm is laid off in fields not exceeding ten or twelve acres each. It is rarely seen that a Dutchman will cultivate more than about ten or twelve acres in Indian corn any one year. They are of opinion that the corn crop is a great exhauster of the soil, and they make but little use of corn for any other purpose than feeding and fattening their swine.

Previous to the war of the revolution, and for several years after, considerable quantities of tobacco were raised in the lower counties of the valley. The cultivation of this crop was first introduced and pursued by immigrants from the eastern counties of Virginia. From the newly cleared lands, two crops of tobacco in succession were generally taken, and it was then appropriated to the culture of other crops. The crop of tobacco left the soil in the finest possible state for the production of other crops. Corn, wheat, rye, flax, oats, potatoes, and every thing else, were almost certain to produce abundant crops, after the crop of tobacco.

In the year 1793 the French revolution broke out, when bread stuffs of every kind suddenly became enormously high; in consequence of which, the farmers in the valley abandoned the cultivation of tobacco, and turned their attention to wheat, which they raised in vast quantities for several years. It was no uncommon thing for the farmer for several years after the commencement of the French revolution, to sell his crops of wheat from one to two, and sometimes at two and a half dollars per bushel, and his flour from ten to fourteen dollars per barrel in our seaport towns.

In the year 1796, the Hessian fly first made its appearance in Virginia. Its ravages that year were limited, and but little damage was sustained in the crops of wheat. The crop of 1797, in the counties contiguous to the Potomac, was generally destroyed, and the same year partial injury was discovered in Frederick county. The crop of 1798, throughout the county of Federick, was nearly destroyed. Ever since which time the farmers have annually suffered more or less from the ravages of this destructive destroyer. This insect had prevailed in some of the northern states for several years before it reached Virginia. It is said it first appeared on Long Island, and was believed to have been imported by the Hessian troops in their straw bedding in the time of the war of the revolution. If this be true, it was a woful curse upon our country,—of which it probably will never be relieved. The present generation have abundant cause to execrate the inhuman policy of our parent state in bringing upon us this heavy calamity, and all future generations will probably join in condemning the British ministry who forced upon our ancestors that unrighteous and disastrous war.

* "Sour krout" is made of the best of cabbage. A box about three feet in length, and six or seven inches wide, with a sharp blade fixed across the bottom, something on the principle of the jack plane, is used for cutting the cabbage. The head being separated from the stalk, and stripped of its outer leaves, is placed in this box, and run back and forth. The cabbage thus cut up is placed in a barrel, a little salt sprinkled on from time to time, then pressed down very closely, and covered over at the open head. In the course of three or four weeks it acquires a sourish taste, and to persons accustomed to the use of it, is a very agreeable and wholesome food. It is said that the use of it, within the last few years, on board of ships, has proved it to be the best preventive known for the scurvy. The use of it is becoming pretty general among all classes of people in the valley.

FUEL.

From the Cultivator.

Economy of Fuel.—We have examined, with interest, a small work, detailing "*Experiments to determine the comparative quantity of heat evolved in the combustion of the principal varieties of wood and coal, used in the United States for fuel; and also to determine the comparative quantity of heat lost by the ordinary apparatus made use of for their combustion—By Marcus Bull.*"

The experiments seem to have been made with great care and accuracy, and the results afford matter of interest to every householder.

Mr. Bull has computed the cost of fuel consumed in Philadelphia, in a given year, to be $80,043, which being divided among the population, gives $7.04 as the average cost of fuel to each inhabitant, supposing the consumption to be equal. Adopting this estimate as a fair average for the population within ten miles of tide-water, in the Atlantic states, from Maine to Georgia, it gives an aggregate of twenty-one millions of dollars as the annual cost of fuel for this portion of population, which is assumed to amount to three millions and a half of our population at half the above price, or $3.50 to each individual, he gives us an aggregate amount of about fifty-one millions of dollars as the total annual expense of fuel, for every purpose in the United States.

The economy of fuel is to be studied—1, in the kind to be selected for use; 2, in its quality and preparation for use; and 3, in the choice of the apparatus in which it is to be used.

In regard to wood.—The quantity of heat evolved by a cubic foot of the several kinds, when in a perfectly dry state, is very nearly in the ratio of their specific gravity, or relative weight, as for example, the specific gravity of shell-bark hickory being 1.000, a cord weighs 4,469 lbs.; by the same scale, the specific gravity of white pine is .476, and the cord weighs only 1,868 lbs. The quantity of heat evolved by a pound of white pine is as great as that evolved by a pound of hickory. The difference in value arises from the great disparity in weight—the hickory weighing as 22, and the

pine as 9—and their relative value being hickory 100, white pine 42—or the first being considerably more than twice as valuable as the latter. The table which we shall append will exhibit the relative value of the different kinds of fuel in common use.

Charcoal forms a considerable item of fuel; and the facts which Mr. Bull has given us upon this subject will be found to be new and interesting. The value of charcoal, like that of wood, is principally to be determined by its weight—a pound from one kind of wood affording about as much heat as a pound from another kind. The quantity, or rather weight, of charcoal, afforded by the different kinds of wood, is nearly in proportion to the relative weight of the wood. Thus hickory produces 26.22, the specific gravity of the dry coal being .625; while the white pine produces 24.35, and the specific gravity of the dry coal being only .298. Thus, whether burnt in the form of wood or of charcoal, a cord of hickory affords more than twice the heat that is found in a cord of white pine. The value of charcoal, however, depends much upon the manner in which it is prepared. The more completely the atmospheric air is excluded from the wood, while under the process of being charred and the more heat that is given to it, the *heavier*, the *harder*, and the *better* will be the product. The best charcoal will be found of a slate color on its surface, dense, sonorous and brittle; while inferior qualities approach to a jet black, and are soft and powdery, upon the exterior. To obtain the best quality, Mr. Bull recommends that the wood be piled in a single tier, that charcoal dust be interposed between the wood, that the pile be covered with clay, and then a layer of sand, to close the cracks which the fire may cause in the clay, and that the fire be communicated at the exterior base, and in the centre and from the top. An intelligent collier, who partially adopted Mr. Bull's recommendation, gained by it 10 per cent. in quantity by measure, and Mr. B. found the coal nearly 20 per cent. heavier than usual. If these facts are correct, and we have no reason to doubt them, it would be an excellent police regulation in our towns, to have charcoal sold by the weight, instead of by measure, and would ultimately be beneficial to the seller as well as to the buyer.

The loss in weight which wood undergoes in drying, and the moisture which it absorbs, by exposure, after it has become dry, are matters of considerable interest to the farmer and the consumer. Hickory wood cut green, and made absolutely dry, experienced a diminution in its weight of 37½ per cent., white oak lost 41 per cent., and soft maple 48 per cent., or very near one-half. Both wood and charcoal, after being made perfectly dry, absorbed in twelve months, under cover, from 8 to 12 per cent. of moisture.

If we assume, says Mr. B. the mean quantity of moisture in the woods, when green, at 42 per cent, the great disadvantage of attempting to burn wood in this state, [or transport it a distance,] must be obvious, as in every 100 lbs. of this compound of wood and water, 42 pounds of aqueous matter must be expelled from the wood, [or transported;] and as the capacity of water for absorbing heat is as 4 to 1, when compared with air, and probably greater during its conversion into vapor, which must be effected before it can escape, the loss of heat must consequently be great.

Common names of Woods and Coals.	Specific gravity of dry wood.	Avoirdupois pounds of dry wood in a cord.	Product of charcoal fr. 100 parts of dry wood by weight.	Specific gravities of dry coal.	Pounds of dry coal in one bushel.	Pounds of charcoal fr. one cord of dry wood.	Bushels of charcoal fr. one cord of dry wood.	Time 10° of heat were maintained in the room by the combustion of 1 lb. of each article.	Value of specified quantities of each article, compared with shell bark hickory as standard.
								6 H. 40 M.	77 Cords.
White ash,.....	.772	3.450	25.74	.547	28.78	888	31	6	65
White beech,.....	.724	3.236	19.62	.518	27.26	635	23	6	63
Black birch,.....	.697	3.115	19 40	.428	22.52	604	27	6	52
Chestnut,.....	.522	2.333	25.29	.379	19.94	590	30	40	58
White elm,.....	.580	2.592	24.85	.357	18.79	644	34	40	58
Shell-bark hickory,.....	1.000	4.469	26.22	.625	32.89	1.172	36	40	100
Pig nut hickory,.....	.949	4.241	25.22	.637	33.52	1.070	32	40	95
Red heart hickory,.....	.829	3.705	22.90	.509	26.78	848	32	30	81
Horn beam, (iron wood,)..	.720	3.218	19.	.455	23.94	611	25		65
Hard maple,.....	.644	2.878	21.43	.431	22.68	617	27	10	60
Soft maple,.....	.597	2.668	20.64	.370	19.47	551	28		54
White oak.....	.855	3.821	21.62	.401	21.10	826	39	20	81
Shell-bark white oak,.....	.775	3.464	21.50	.437	22.99	745	32	20	74
Pin oak,.....	.747	3.329	22.22	.436	22.94	742	32	20	71
Red oak,.....	.728	3.254	22.43	.400	21.05	630	30	20	69
Rock chestnut oak,.....	.678	3.030	20.86	.436	22.94	632	28		61
Pitch pines,.....	.426	1.904	26.76	.298	15.68	510	33	40	43
White pine.....	.418	1.868	24.35	.293	15.42	455	30	40	42
Lombardy poplar,.....	.397	1.774	25.	.245	12.89	444	34	40	40

The above is merely an abstract of Mr. Bull's table, comprising merely the woods in most common use among us. The last column exhibits the relative value of a cord, according to the heat which each affords. Thus, if hickory is worth one dollar, pig nut hickory is worth 95 cents, hard maple 60, white oak 81 cents, white pine 42 cents, pitch pine 43 cents, &c.

We will now exhibit, in tabular form, the relative value of coals, by the same standard, merely remarking, that a ton of anthracite coal is considered about equal to a cord of shell bark hickory.

COALS.	Specific gravity of dry coal.	Pounds of dry coal in one bushel.	Time 10 deg. of heat were maintained in the room by the combustion of 1 pound of each article.		Value of specified quantities of each article, compared with shell-bark hickory as the standard.
			H.	M.	Tons.
Lehigh	1.494	78.61	13	10	99
Lacawana	1.400	73.67	13	10	99
Rhode Island	1.438	75.67	9	30	71
Schuylkill	1.453	76.46	13	40	103
Susquehanna	1.373	72.25	13	10	99
Worcester	2.104	110.71	7	50	59
					100 bushels
Liverpool	1.240	65.25	10	30	230
Richmond	1.246	65.56	9	20	205
Hickory char.	.625	32.89	15		166
Maple do.	.431	22.68	15		114
Oak do.	.401	21.10	15		106
Pine do.	.285	15.	15		75
Coke	.557	29.31	12	50	126

Economy of Burning.

Mr. Bull's experiments were made in a sheet iron stove, with 42 feet of two inch pipe, having about 20 elbows. A thermometer placed at the mouth of this pipe indicated the same temperature as another hung against the wall of the room, which showed that all the heat given off by the combustion of the fuel, was retained in the room. On the supposition that 100 lbs. of fuel, consumed in this stove, would maintain a temperature of 60 degrees for 12 hours, he found, that to maintain the like temperature for the same time, by other apparatus the fuel must be increased as follows:

In the experiment stove it required - -	lbs. 100
In the sheet iron cylinder stove, the interior surface coated with clay lute, with nine elbow joints, and 13½ feet of 2 inch pipe,	105
In a like stove and pipe, with 3 elbow joints,	122
In a like stove, and similar pipe and joints, but the pipe placed more vertical than the preceding, - - - - - - - - -	128
In a like stove, with 5 feet of pipe and one elbow, - - - - - - - - - - - -	149
In a like stove, without clay lute, one elbow, and five feet of four inch pipe,	222
In an open Franklin, with one elbow, and five feet of six inch pipe, - - - - -	270
In an open ordinary parlor grate, - -	555
In an open chimney fire place, - - -	1,000

It would seem from these experiments, that ninetenths of the heat given off by fuel burnt in an ordinary fire-place, are carried off in the draft, without benefiting the room; that nearly one-half is wasted when the fuel is consumed in an open parlor grate, and that lining a stove with fire brick, or clay lute, produces a great economy in fuel.

The experiments afford important suggestions to the housekeeper. Assuming as data, that four cords of dry shell-bark hickory, burnt in a sheet iron cylinder stove, with five feet of pipe and one elbow will warm an ordinary room during the winter months, it will require to keep up the like temperature, in a similar stove, the following quantities of other materials:

Hickory, as stated - -	4 cords,
White oak, - - - - -	4 3-4 "
Hard maple, - - - - -	6 2-3 "
Soft maple, - - - - -	7 1-5 "
Pitch pine, - - - - -	9 1-7 "
White pine, - - - - -	9 1-5 "
Anthracite coal, - - -	4 tons.

THE ARMY WORM.

From the Picayune.

Mr. Editor,—Having seen in your interesting hebdomadal a request that some one of your country readers would favor you with a quantity of the caterpillar or army-worm, I accordingly send you a number of these voracious and destructive worms alive, and a few of the aurelia or chrysalis, being the change that the caterpillar undergoes previous to its metamorphosis into the moth or butterfly. I also send you a cotton stalk, that you may see how completely these worms strip the plant of its leaves, blossoms, buds, and young bolls or pods.

I put a number of the chrysalis in a glass shade, which were in a few days transformed into a dirty brown-colored, mealy-winged moth, somewhat similar in appearance to the moth commonly called the *miller*. These moths are believed to deposite their eggs on the reverse of the leaf. The young worm at first is not thicker than a fine needle. It eats a small portion of the under part of the leaf around it, without penetrating through. Having acquired strength, it ascends the upper side of the leaf, devouring every part, with the exception of the fibres, as you will see by the accompanying plant. While the myriads are engaged in their work of destruction, a sickly, somewhat fœtid smell exhales, and a noise is heard like a gentle rain, caused by the forcep-shaped mouths of the intruders devouring their food, and their excrements pattering on the leaves in their descent. The latter are so abundant that the ground under the plant is discolored.

Having heard that the plantations of my neighbors had been overrun with this scourge a short time before I perceived any signs, I flattered myself that I would escape; but going one morning into the field, I found it literally covered, and a few days sufficed to strip it entirely. Desirous of discovering the means of destroying the worm or arresting its ravages, I caused a quantity of roll-brimstone to be pulverized, and a spoonful put around the root of forty or fifty plants, thinking that the deleterious principle would be absorbed by the plant, and cause the worm to abandon it. This was attended with no effect. I caused two or three to be fumigated, but the worms remained

on the leaves until they withered and the plant died. I then caused lime to be sprinkled on several rows of plants, in the morning, previous to the evaporation of the dew, that it might adhere to the leaf. This caused the caterpillars to abandon the surface and betake themselves to the under part of the leaf. I find that the plants on which this experiment was made have not suffered as much as the others.

Some eight or ten evenings since, a considerable number of the moths came into my house, where, attracted by the light of the candles, they burnt their wings.

This circumstance made it recur to my memory that I had formerly heard old planters state they had arrested the ravages of these destructive worms by making numerous large fires in their fields after dark.

Three days previous to the visit of the caterpillar, my field presented a beautiful green appearance; the plants were covered with the blossom and bolls, and I have every reason to believe that I would make about 300 bales of cotton. Now it is sear and yellow, exhibiting a most desolate aspect, and I do not expect to make over 100 bales.

STEPHEN HENDERSON.

Baton Rouge, Sept. 25, 1840.

POSTSCRIPT, ON KENTUCKY BLUE-GRASS (OR VIRGINIA GREEN-SWARD.)

To the Editor of the Farmers' Register.

Frankfort, October 26, 1840.

Dear Sir:—I learn from a very intelligent Virginia friend, who did me the favor to dine with me since the date of my letter of the 22d inst., that the *Virginia wire-grass* is not the same so called here. Indeed, he stated that he had never seen any wire-grass, so known in Virginia, in this state. Here is another illustration of the utter confusion in the popular nomenclature of plants, &c.

That which I have been taught to designate by the vulgar name *wire-grass*, is not a gramineous but a small herbaceous plant, having a strong tap-root from which small fibrous roots are sent out like those from the beet. Its branches run along the ground, and the leaf is very small, short and oval shaped. Blue-grass here obtains an easy victory over it.

My Virginia friend requests me to say to your correspondent that, "if he will swop his wire-grass for Kentucky blue-grass, he need not fear getting a witch for his devil; but will certainly obtain an angel instead."

I have no doubt our "angel" would easily conquer your "devil." Nothing can stand before it here, and I see not why it would not prove equally potent in your state. Mr. Flint beautifully compares its habits to those of the robin red-breast—delighting in the haunts of men. But you can easily test its value by a small experiment on an acre of marled land. It would no doubt thrive well in your yards, by giving it a spring dressing of leached ashes or old lime.

Perhaps it may be acceptable to your correspondent to add, that our blue-grass pastures are easily cultivated when we wish to subject them to the plough. A strong two-horse plough can easily run through the closest turf. The best practice here is, first to run just through the sod and turn it flat over; then following in the same furrow, bury it beneath the soil brought up by the second plough. Frequently, a third plough follows in the same furrow; but the expediency of this is determinable by the character and depth of the soil. You published a letter of mine to the Franklin Farmer a few weeks (or months) ago, on the improvement of the soil resulting from the grazing system, which, your correspondent will find, has something in it applicable to the subject now considered. The blue-grass sod, thus disposed of, never troubles us in the after culture; but I doubt if you have sufficient depth of soil thus to dispose of it. If, however, you have, you need never fear being troubled by our blue-grass, if you desire to turn a pasture of it into tillage.

Yours truly,

THO. B. STEVENSON.

BARNUM'S MACHINE FOR HEATING WATER.

From the American Farmer.

This new apparatus for "*heating water*" is represented as a great improvement over others, by certificates, as to its economy and despatch, both in its cost and operation, founded on actual experiment and use of the machine.

The apparatus we saw was on board the steamboat Maryland, in possession of Mr. Wm. Nabb, of Talbot county. Its cost was $15. Having no tact for description of machinery, we cannot undertake to explain its construction or *modus operandi.*

It consists of a copper hollow cylinder in diameter about the size of a two gallon whisky jug—(we like to illustrate by *familiar objects*)—This cylinder stands upright on feet perhaps about 12 or 15 inches from the ground, the cylinder itself being about 18 inches long or high. On a grate which lies inside and across at the bottom of this is built a fire with coal or any light wood. On the top, dropping down within it a few inches, stands a flue or chimney of sheet iron, with a small door like a stove-door to drop in the coal or wood. Then there are from this cylinder two copper tubes, one exactly, and a few inches, above the other, about the size of a lady's wrist, (we have seen some ankles not much larger.) These tubes connect with the wooden vessel containing the water to be boiled, which stands at a small distance, say 12 or 18 inches off. Thus the water which is placed in the wooden vessel passes through the tubes, and around the copper cylinder, and the heat of the little furnace within the cylinder puts the water in motion, and keeps up a constant circulation or revolution, and it is asserted by all the signers of these certificates, that while the water is made to boil much quicker than by the ordinary process, there is a saving of more than half the fuel. It has, too, the advantage of being useable out of doors, and portable from one point to another. It is getting into common use among hatters; also where much washing is to be done—for boiling food for hogs, and water for cleaning hogs, &c.

The apparatus, as appears by a card before us, is sold by James Cortlan, No. 10, Baltimore, and No. 6, Harrison-street, Baltimore. What particu-

larly drew our notice to it was the supposition that, besides other uses, it may be the very thing wanted for cooking food for domestic animals. We have said at least enough to guide those who may desire, what is best in all such cases, *to see and judge for themselves.*

REPUBLICATION OF TAYLOR'S 'ARATOR.'

We lately received, from a gentleman in the west, distinguished for his ability as a writer on agriculture, and his acquaintance with the works of others on that subject, a letter containing the following passage:

"I am almost ashamed to own I have never seen a copy of Col. Taylor's 'Arator.' I have endeavored for years to get it; but have never been so fortunate as to find it either in the shops or private hands, though I have made many inquiries. I presume it must be nearly out of print; but it is probable some one in your neighborhood would sell his copy. If you can thus or otherwise procure me a copy, without troubling yourself, I shall deem it a singular favor."

Some years ago a similar request, upon the same grounds, was received from the deceased Judge Buel, which we took pleasure in complying with, by presenting him with one of our then spare copies—as we would do now, for the recent applicant, except that we have but one copy left, and have in vain sought in this town for another, to present to our correspondent. This new evidence of the scarcity of this work has induced the early completion of a design which had been before entertained and postponed, that is, the publication of a new edition of 'Arator' in the Farmers' Register. This will be done in the next number, which will be made to contain the entire work.

HOVEN CATTLE.

From the American Farmer.

One of my cows, a very valuable animal of the common breed, lately became bloated or "hoven," in consequence of getting into the barn-floor through a door which was carelessly left open, and eating her fill of potatoes. She was swelled up, as tight as the skin could hold in about twelve or fifteen hours after eating them. Upon discovering the painful and dangerous situation of the cow, I immediately sent for a neighbor who had frequently relieved hoven cattle by plunging a knife into the paunch, and thus affording an exit for the confined air.—This was done first with a pen-knife then with a Spanish dirk knife, without the desired effect, no air escaping through the puncture. Being anxious to relieve the suffering animal, it occurred to me that what would be beneficial in the human subject, under similar circumstances, or in Tympanites intestinalis, might possibly give relief. I lost no time until I had a decoction of *anise and fennel seed,* prepared by boiling for a few minutes a handful composed of equal quantities of the two, in a pint of water—This I added to a pound of hogs-lard, and bridling the cow, raised her head by pulling the reins over the top rail of a fence, and gave it to her in the usual way. She appeared to be sinking so fast now, that we drove her out to a field to die. When there she soon laid down, very much exhausted, and panting laboriously, seemed to be rapidly approaching the end of her sufferings. I now concluded to try another dose of the carminative and lard, having observed that she frequently eructated, since giving the first dose. We accordingly had another prepared, in all respects like the first. This we had no difficulty in getting down, *as she lay,* without the bridle.--Shortly after the exhibition of this dose, the air began to roll in large and frequently repeated volumes, up the gullet—this effect of the medicine continuing at short intervals—in half an hour the cow was quite relieved, and walking about. The effect of this simple remedy was indeed most admirable, and deserves to be known by every person owning a cow. One of my neighbors has since experienced the good effects of it in the case of a cow that had become hoven in consequence of eating corn and corn-fodder in the shock. It may not be amiss to mention that the lard, in the above prescription, was recommended, in the first place as a purgative, and therefore became a part of the drench. Tar was put on the puncture, and it healed kindly.

R. NEBINGER.

Lewisburg, Pa. Oct. 20, 1840.

MEETING OF TOBACCO PLANTERS.

At a large and respectable meeting of the tobacco planters of the county of Dinwiddie, held at the Court-house, on the 19th of October, 1840,

Col Benjamin Johnson was called to the chair, and Wm. M. Gill appointed secretary.

The object of the meeting was explained by Dr. H. C. Worsham, who presented for its consideration the following preamble and resolutions, and urged their adoption by a brief and spirited address.

On motion of Capt. John H. Edwards, they were then unanimously adopted:—

That in conformity to the principles of our government, we cherish and entertain towards all nations feelings of amity and respect, and desire a perpetuation of the same so long as they can be maintained upon just and liberal principles: That as a government we have extended the olive branch to all nations, and offered to all, trade and commerce upon terms of mutual reciprocity; and whilst our liberality has been freely accepted and extensively enjoyed, we have received, in return, comparatively little else than monopoly and exclusion: That whilst several of the nations of Europe are literally inundating our country with their luxuries, nearly duty free, thereby poisoning our morals and enervating our constitutions. *Tobacco,* the most valued staple of nearly two millions of American freemen, is allowed to be taxed in their countries from one hundred to upwards of eight hundred per cent.: That whilst the powers of reason have stripped this exorbitancy of every legitimate basis of support, it is still persisted in, regard-

less of its unfeeling exaction, and sought alone to be sustained as a revenue principle: That a longer submission to so gross, palpable, and iniquitous an imposition, is incompatible with our feelings of independence, and at war with the principles of international justice: That whilst in a spirit of peace we have submitted to the odious and monopolizing Corn Laws of England, we utterly repudiate, as revolting to our sense of justice, the idea of a longer submission to the enormous and oppressive duties now imposed upon our tobacco,—Therefore

Resolved, 1st. That we highly approve the call of a convention of tobacco planters, to assemble at Washington City on the 15th of December next, and earnestly urge our sister counties to hold timely meetings and respond to the call.

Resolved, 2d. That our representatives in congress be instructed, and our senators requested, to use their utmost exertions for the introduction and support of such measures, as shall in their wisdom be deemed best calculated to secure a speedy reduction of the duties upon tobacco to a rateable standard with the most favored articles of foreign importation.

Resolved, 3d. That the sincere thanks of the meeting be cordially tendered to the Hon. Daniel Jenifer, of Maryland, for the zeal which he has manifested in his advocacy of the tobacco-growing interest.

On motion of Herbert Reese,

Resolved, That the chairman of this meeting appoint six delegates to represent this county in said convention, with the special understanding, previously ascertained, that all will attend.

Whereupon the following gentlemen were designated:—H. C. Worsham, John W. Gilliam, James W. Eppes, Abner Adams, John Hardaway, and Wm. M. Gill.

On motion of Capt. John H. Edwards,

Resolved, That Geo. C. Dromgoole and Hugh A. Garland, be appointed alternates to represent this county in said convention, with the special request that they attend.

On motion of Capt. Daniel Butts,

Resolved, That a copy of the proceedings of this meeting be forwarded to the Hon. Daniel Jenifer, to our representative in congress, to the Hon. H. A. Garland, and to each of our senators.

On motion of James W. Eppes,

Resolved, That a copy of the proceedings of this meeting be signed by the chairman and secretary, and forwarded to the Petersburg Statesman, and Intelligencer, the Richmond Enquirer, and Whig, the American Farmer, and Farmers' Register, for publication.

On motion of Dr. H. C. Worsham,

Resolved, That this meeting now adjourn.

BENJ. JOHNSON, *Chairman.*

WM. M. GILL, *Secretary.*

THE DRAINED POND.

From the Farmers' Monthly Visitor.

There is at the point of this road, where the waters of the Passumsic and the waters running north into lake Memphremagog and the river St. Lawrence have their source, a natural curiosity which goes to confirm our theory that the rich amphitheatres among the hills constituting some of the best townships of Vermont were originally lakes and ponds of water. In the town of Glover up to the year 1817 near the summit level there was a pond of considerable extent, which discharged its waters on the way to Long Island Sound through the valley of the Passumsic. In the first settlement of the wilderness beyond towards Canada, a man had erected a mill below the level of the pond on a small stream running the other way. As he had a deficiency of water it occurred to him that he might bring to his aid a portion of the waters in the pond, there being only a small ridge barring them out. He commenced digging out a passage way upon the surface of the ridge, and found the soil so pliable that the work of an hour or two brought it down to the surface of the pond. The water began to flow, and in a few minutes made such progress that he barely had time to run to the mill and alarm his wife whom be knew to be there so that she might retreat to a place of safety. The artificial or natural ridge was not able to stand for a moment when the water had once gained headway. Down it came, taking off the mill in a moment, and carrying along with it trees and rocks weighing many tons and every other obstruction, sweeping down to the lake an immense mass of material. Since that time a simple brook running towards the lake Memphremagog is all that is left of the pond; and the ground constituting and surrounding its bed, is just like that of other valleys on which we suppose the water to have rested in days long subsequent to the creation. The travelled road pursues its course through the bed of this pond.

Returning to our journey; there has grown up within a very few years a considerable village called North Danville upon a stream which from the height of land unites with the Passumsic at St. Johnsbury.

FOOD FOR STOCK. CYMBLIN (OR SQUASH) CULTURE.

From the American Farmer of 1820.

Mr. Skinner,—A writer for your paper of the 7th ult. over the signature of Silvanus, has offered excellent advice for curing bacon, and insists that the hogs for this purpose must be corn-fed. How long must they be so fed, is the question?

Experience has shown, that it requires but a very short time, to entirely change the flavor and texture of all kinds of flesh. In the year 1770, I resided in New Jersey, where it was the custom to take great numbers of wild pigeons in spring-nets, by the assistance of decoy pigeons, prepared for the purpose. The flesh of these birds, when first taken, is always very dark, and most generally tough. I have seen more than 300 of them confined, and fed in a large corn-house, and in one week, their flesh has not only become tender, but as white as a well fed chicken.

In 1784, I promised to present to a brother, just married, a prime beef towards his winter stores,—I had a fine steer and a spayed heifer, in a large wheat field, abounding with wild garlic; my brother named a day to send for his beef, and three days previous, we killed the heifer, which although extremely fat, was to my great disappoint-

ment so thoroughly tainted with garlic, even to the marrow in the bones, that my house servants refused to eat it.—A bad prospect for my brother, whose wagon came the fourth day, and in despair I killed his beef, which was beautiful to the eye. I did not at the time pay much attention to a remark of his feeder, who observed that the steer had not eat any thing since the heifer was killed; my trouble was, the certainty of my brother's disappointment, but to my great joy, I soon received his letter of thanks saying, that a more juicy, tender, and fine flavored beef, could not be.

Take two lambs of equal age from a garlic pasture, kill one immediately, and the flesh will be so tainted with the garlic, that no person of tolerable taste can eat it; keep the second from all food for one night or ten hours, and there will not be the slightest garlic taste. It is well known that cattle fed upon oil cake, cannot be immediately killed; but if kept from this food for two or three days, the oily taste is removed.

The foregoing facts are known to every experienced farmer, and they have convinced *me*, that hogs fed upon corn for two weeks, are much better than two months, for the plain reason that the flesh is equally good, and the expense is less.

Hogs, as generally managed, are not only the most troublesome, but the most costly flesh we consume, and I have for many years been in pursuit of a plan to lighten the cost of their flesh which is so absolutely necessary for the establishment of every Marylander. I flatter myself that I now see my way clear; for after two years' trial, I am well satisfied, that the use of cymblins, pumpkins, ruta baga and clover will enable me to send more corn to market, and with two weeks feeding upon that precious grain, my bacon will not yield to that of any person. No branch of rural economy requires more attention than feeding our various kinds of stock. Our northern friends laugh, and say, that in Maryland the hogs eat all our corn, and our negroes eat all our hogs. This is too true to be denied, and if my mite can in your opinion be of any use to the public, it is at your service.

As early as the season will admit, I prepare ground for cymblins, or squashes (cucurbita verucosa.) Rich land is best for all purposes, but in this case, it is the first object to choose a place convenient to your hogs' range. After ploughing and preparing the ground in the best manner, lay it off by a single furrow, four feet each way, and at the intersection, manure highly with well prepared manure, mixing it well with the soil, by spade or hoe. Upon this ground so prepared, plant cymblins (and the bunch kind I think best,) in every other row and hill, which will give to you at eight feet apart each way, about 680 hills to the acre. After planting the cymblins, proceed to plant corn in the rows running north and south, that is only in one direction, between every row of cymblins, and which being eight by four apart, will give you about 1361 hills of corn to the acre. It is unnecessary to remind the careful farmer, that the most scrupulous attention should be paid to this ground, while the vines are young, for after they begin to fruit, and run, nothing can be done, except to pull by hand the strong high weeds.—When the fruit appears, be careful to mark for future seed, such as you wish to propagate, for it is desirable to have early fruit.

The drought of last summer will not be soon forgotten, and yet from less than an acre of unfavorable ground, I kept in high condition more than 60 head of hogs of all ages (sucklings excepted;) they had not any grain, and but little grass. It was our rule to take a certain number of rows every day, so that there was an interval of five days, and all fruit as large as a man's fist was pulled. It would sometimes happen, that fruit was neglected until it became hard, but not dry; in this case, the feeder cracked them upon his cart wheel.—A careful and steady person should be appointed to pull, one who will neither neglect the fruit, or tread upon the vines, for if well managed they will continue bearing until your pompions are ready, and these will carry you on to the fortnight before the intended day of killing.

I claim no merit from the cymblin culture, it justly belongs to Tench Tilghman, Esq. of Talbot, and other gentlemen of that county, but, believe me, that while I continue to raise my own pork, I never will omit the cymblin culture. Let us however not forget the pompion as an able, and almost necessary auxiliary, and of which there are many varieties; the long yellow is, I think, for many reasons, the best. In 1818 my cymblin patch was small, and as my object was not only to have fat pork but to save corn, I began early with the pompions; yet hogs could not be fatter, and my stock of old hams, can yet testify the quality of the meat. Yet cymblins and pompions are not alone a sufficient substitute for corn; some food is necessary to carry you through the winter and spring, until your clover and cymblins are ready. The ruta baga is an excellent vegetable, which will supply your want. We now know that they are infinitely more nutritious than the common turnip, that they are sufficiently hardy to remain in the ground through the winter, and yet better, if buried in small heaps in a well shaded northern aspect. They will be found in high preservation to July.

Clover is less injured by hogs than by any other stock, by sheep the most, and hogs after a few days will not root it up; but it is desirable that every farm should be provided with a hog range well enclosed, uniting wood land for acorns and shade, bottom land for water, rooting and wallowing, and contiguity to clover. Ten hogs will not injure the growth of timber, as much as one cow. The hog indeed eats all the acorns he touches, but in his rootings he buries great numbers to a secure depth: the cow not only nips, and of course kills all the young sprouts of nuts, which she perseveringly hunts after, but she browses upon and tears down young limbs, and rubs and twiss young sprouts from stumps.

If I have extended my remarks beyond a mere recommendation of the cymblin culture, and with a view to save grain, which is always a cash article; it is also from a wish to encourage persons who reside upon poor lands adjoining extensive wood-ranges, to turn their attention to rearing hogs upon a large scale.

For the cymblin, pompion, and ruta baga, but little land is necessary, and for the two first articles, but little manure. Clover is certainly of great service, but if there is plenty of the other vegetables, it may safely be dispensed with. I would give you my opinion of the quantity of ground necessary for twenty hogs, but fear I have already trespassed on your time.

I must however observe, that instead of washing my bacon with warm water, previous to hanging it, I have experienced the best effects from washing with a strong lie, made from clean hickory ashes. I am respectfully yours, &c.

A SUBSCRIBER.

TREATMENT OF PEACH TREES.

From the New Genesee Farmer.

In a late number of our paper, we noticed the difference between peach trees suffering from the *yellows*, and from the worm at the root; but it is remarkable that some intelligent minds seem unable to comprehend the distinction. One imagines that this disease is induced by the worm; another thinks it is caused by intense cold suddenly succeeding mild weather in winter; and a third is satisfied it arises from the root soaking in mineral water. These opinions would be entitled to some respect, if the authors had respectively taken the pains to show us that the supposed cause was sufficient to explain the whole phenomena; but so carelessly have they looked at the subject, that they appear not to know that *the yellows* is contagious. Neither do they appear to know that it commenced its ravages in Pennsylvania and New Jersey, about the year 1797. Let us ask, however, were there no peach worms, no unfavorable seasons, and no mineral springs for the trees to dip their roots in, previous to the year 1797? Peach trees were cultivated near Philadelphia for more than a century before any such diseases appear to have been known; and in western New York more than thirty years passed away, after the Indian had resigned his old peach orchard to the white man, before it was *introduced* amongst us, yet the worm was busy, the weather came as it listed; and the mineral springs, where there were any, soaked away as they had done for centuries before.

The origin of this disease affords an interesting subject of inquiry and speculation; but, like the origin of the small pox and measles, it will probably remain unknown; and the horticulturist may do well without such discovery, if he can be made properly to understand that it is *very contagious*. With this idea fairly before him, he will remove the sickly trees from his garden before they contaminate the others; and he will be careful not to let any tool that has been so employed, especially the saw, be used on a healthy tree before it has been thoroughly cleansed.

The peach worm, though an enemy not to be despised, rarely destroys a tree, except when it is small, or when considerable numbers attack it at the same time. It has been several years since we went round among our large trees to search for this insect; and we have no reason to think that more than two or three have suffered materially. Still we would recommend the search to every proprietor who can steal away from his other avocations.

The oozing of the gum in wet weather is no certain indication of the worm, especially if it be on the trunk a foot or more from the ground; but when the gum is crowded with filth, diligent search should be made. Remove the earth from the tree to the depth of two or three inches; and with a strong pocket knife endeavor to find the cavity where the depredator resides. Vile as the outside of his dwelling appears, the inside is generally kept clean—(not crowded with ordure like the track of the borer.) When the knife once enters this covered way, which is cut in the pulpy part of the bark, it is commonly easy to find him; but in all cases where it is practicable, cut longitudinally, and not crosswise. When the worm is removed,—and no creature can be more helpless when he is expelled from his nest,—the hole should be laid open through its whole length, and then filled with clay mortar, or some other composition. A peach tree very speedily recovers from such wounds.

Lime or ashes laid close round the tree is an excellent preventive of the worm; and if the lime has become mild, or the ashes leached, one or two shovelfuls may be very safely applied. Quick lime, especially hot lime, or unleached ashes, however, may require to be given in smaller quantities.

The advantages of such applications appear to be that the grass is destroyed, and consequently the bark is harder down to the very surface of the lime or ashes,—near which the mother insect is more unwilling to deposite her eggs.

A few words in regard to pruning. As soon as the peach trees show symptoms of being stunted by bearing,—amputate, and encourage the growth of young vigorous branches. The fruit on such is often as fine as the fruit of a young tree.

BLOODY MILK—INQUIRY.

From the Cultivator.

"*Gentlemen*—I should be glad to obtain a remedy for a disease in the udder of cows like the following: On Sunday evening I discovered that bloody milk was drawn from one teat, accompanied with a slight swelling behind it. On Monday morning one-half of the udder was so badly swollen as to render it nearly impossible to milk the two teats affected; the other two teats remained unaffected. It has continued until this time, (Saturday;) there is no appearance of external injury; though I should state that some time previous to my purchasing her, three months since, she had had a back rib broken.

"M. R. GRISWOLD.

"*Middletown, Ct.*, 1840."

Bloody milk may be occasioned by external injuries; by garget, in which case it is usually combined with swelling, and the discharge of stringy matter; or by pressing the udder or teat in milking so unskilfully as to rupture some of the fine blood vessels within, and cause the blood to be discharged with the milk. When it arises from garget, the best remedy we have known used, is to cut the scoke, or garget root, as it is sometimes called, into fine pieces, and feed a handful or two to the cow with a mess of bran or cut vegetables. Where the bleeding arises from external injuries, or a rupture of vessels, washing the bag or udder, by preventing inflammation, will produce a good effect. Salt and water has been recommended for this purpose. Giving bloody milk is, however, at times a fault from which a cow cannot be freed, and that part of her udder must be lost, or the animal fed for the butcher.

"MILKING."

From the Cultivator.

Messrs. Gaylord & Tucker—In answer to Mr. Freeman, your Indiana correspondent, who asks, "Is there any remedy to keep a cow from holding up her milk?" I beg leave to say, I think there is a very simple and sure remedy. I have for many years occasionally used it, and have in no instance known it to fail. When a child, I noticed, with surprise, that a calf, when beginning to suck, would frequently change from one teat to another, and butt with considerable force the udder of its dam; and I inquired of a person near me, why the calf did this? The answer I received was, "to make the cow give down her milk." This answer was undoubtedly correct. Since then, when milking, and the cow retained her milk, by imitating with my hand, this action of the calf, she would immediately cease to withhold it, and the milk would flow freely.

In every instance that has fallen under my observation of a cow's retaining her milk, I have noticed circumstances that convinced me that it was not wholly an involuntary act; as for instance, the strong contraction of the abdominable muscles, and her ceasing to chew the cud. Under these circumstances, by imitating with the hand the butting of the calf, the careful observer will not fail to notice an immediate relaxation of these muscles; and when the milk is permitted by the cow to flow unrestrained, she will rarely fail to immediately recommence the chewing her cud.

These hints are intended merely as a supplement to the directions you have appended to Mr. Freeman's communication, which should never be neglected; and should any one fail to treat with deserved gentleness and kindness, that most useful animal the cow, the better part of your readers would not be anxious to lavish their sympathy upon him, should he, in return, fail to receive the rich reward due only to the deserving.

I am respectfully yours,

N. IVES.

Wallingford, Vt., Sept. 10, 1840.

RULES FOR BREEDING.

From the Farmer's Gazette.

What follows may appear to be dreaminess, to unprofound intellects, who have not studied physiology. It is an epitome, *mainly*, of Mr. Walker's *new* views of organization. Yet mankind had discovered, previous to Mr. Walker's publication, that they possessed the power of amelioration, and that of deterioration, of their own organization, in their offspring. They knew that organic laws like their own existed in domestic animals. What all these laws were, in either case as regards generation, was unknown, previous to Mr. Walker's publication. This book gives a much more nice rule, or rules, for breeding offspring, than has hitherto existed; and will, without doubt, be soon applied to breeding profitably domestic animals, if not to breeding men. Profitableness, from the last act alluded to, may be too remote to excite attention. The newly discovered law can be applied to use, by unphilosophical persons, like the mariner's compass, or the thermometer. The organic law, or laws, to regulate our conduct are as follows:

1. Animal organization grows, from two parents in two, somewhat, unsymmetrical halves; and each part has mostly the properties of the parent from which it is derived, notwithstanding the nutritious blood, which circulates through both halves. Atavism and freaks of organization may change this tendency of growth, somewhat, in some few cases. Organization is indestructible, save by the death of the whole, or a part of it, and is continued in posterity. Its growth, however, is so modified, as to occasion an amalgamation, or suitable joining of the two halves during life. And the blood moving through both halves makes children of the same parents resemble each other.

2. The most excitable parent, for the time being, always gives, for future growth, *the vital viscera within the whole trunk, and likewise the intellectual part of the brain, which grows within the forehead.* The less ardent parent, on the other hand, gives matter *for the growth of the bones, the locomotive organization, the back head, limbs and moveable parts of the face.* Parental seed grows, during the life of offspring, into the likeness of the parent, from which it came. And so on, ad infinitum.

3. The female is generally, *yet not always*, the most ardent, for anatomical reasons. The passionateness in either sex may be increased by previous unindulgence. Hence if good intellects and sound viscera are wanted, in most men, in many cattle, in hogs, in some sheep, females should be the best, and in vigorous health; while in horses, camels, elephants and in some men, where speed and muscular strength is mostly wanted, the male should be the best; unless the conclusion be that both male and female be equally good, or the best of their kind, and of nearly equal and suitable age; in which case there can be little chance for disappointment, unless there be *quasi identity* of organization, as that of pernicious "in and in breeding."

4. The above are golden rules or problems; yet some unlikeness is wanted. Hence the utility of properly crossing of breeds in the same race. Amativeness cannot exist without dissimilarity of organization. The faculty of propagation fails, from too much likeness, as it does from too much age.

5. Let it always be borne in mind, that it is the resemblance, as regards the configuration of any organization, much more than that of its size, or structure, which enables any one to perceive which parts have been derived from a given parent. Prominent cases may be needed for beginners, in this science under review. The size and structure of a part varies with the age of its growth, more than is the case as regards form. Besides, to know structure dissection is needed. It is a general mental law to identify, on the one hand, the species of organization by its shape, and on the other hand, its age by its size.

6. Walker's science was much wanted to finish that of Dr. Gall, or what may be viewed as pertaining to phrenology. The pen is stopped, because it is presumed, that no one will act upon Mr. Walker's plan without studying his book attentively. It has some errors without doubt; and it may too often attempt to explain what is beyond the ken of useful philosophy. We have not

minds given us to penetrate the modus operandi of growth. Nor can we penetrate, otherwise than by conjecture, what may have been the laws of nature, previous to the era of history and science. The object is to turn the attention of newspaper readers to Mr. Walker's book on Intermarriages.

CULTURE OF THE STRAWBERRY.

From the Cultivator.

Messrs. Gaylord and Tucker.—In my last I promised to give you my plan of cultivating the strawberry, which having succeeded for seven or eight years, producing a full supply of fruit, with much less labor, is, I conceive, worthy of being made public. The duration of a bed cultivated after my plan, is also a matter of great consequence.

I have never grown any of the choicest varieties except Keene's seedling, nor have produced fruit so large as I have seen figured or described, but as to the amount produced on a given space, I think I can compete with the most fortunate or skilful.

For soil I choose that between the extremes of dry and moist, a little gravelly I prefer, which I prepare by mixing well rotted leaves, rotten wood and cow yard manure in about equal quantities, which I have well mixed with the soil, by spading or ploughing in deep, if with the plough, some two or three times. I then level the ground, but do not raise it above the walks, so that it will receive and retain all the water which falls upon it. Thus prepared, I proceed with my plantation, either in autumn or spring. The former is preferable, provided the weather is favorable for transplanting in August or September, so that the young plants can take root sufficient to endure the winter. In planting I arrange my beds about six feet wide, putting in the plants about a foot asunder each way. At or near the approach of winter, I give a slight covering of tan bark, say the first year, the second of wet or rotting leaves, and the third of some light mould or well rotted manure, and so on alternately. The tan or leaves are best the first year, as either of them better protects the plants. If the plantation was made in autumn, by the next July or August the whole surface should be well covered with the vines, which will spring up through the top-dressing without difficulty; at which time I pass through the plantation with a spade, cutting through, say lengthwise about one spit wide, and turning under the plants, then leaving about the same width, and so on alternately through the whole bed. Top-dress as above for the winter, and next spring, as soon as the frost is out and the ground sufficiently dry to leave the earth or soil light and mellow, I cut through the bed crosswise with the spade in the same manner as before. If the plantation was made in the spring, the first spading should be performed the next spring, and so on semi-annually from year to year. In an old bed I take care to turn under the old plants, so as always to keep up a succession of new and vigorous plants—I never disturb the manures, and do not know but the best time to perform the second spading of the season would be immediately after gathering the fruit, so as to give the runners a light open soil to take root in. From the success I have met with by this process, I am inclined to think that a bed or plantation will last twenty years, or perhaps even a century—I had a bed seven years old, in a garden I abandoned, without any care last spring or even last year after the March working, which produced its usual quantity of fruit this season.

During the blooming season, unless in wet weather, I always give a slight watering from a pot every evening to set the fruit. This must never be omitted if fruit be an object.

Another circumstance must not be overlooked, that you have bearing or fertile plants. A little observation or skill on the part of the cultivator will enable him to distinguish the barren from the fertile plants, from the large, showy flowers, with long stamens, red or black anthers of the former, while the latter are almost destitute of stamens or anthers, and the petals of the flowers are very small. It is said to be necessary to plant both kinds together in order to success. Of the truth of this I have some doubts, but I have not experimented sufficiently on the matter to determine.

As to the produce, I believe, without difficulty, by my plan of culture I can grow *one hundred and sixty bushels* of this delicious fruit to the acre, per annum, or one bushel to every square rod. Indeed, I have by actual measurement greatly exceeded this.

I. DILLE.

THE ICE MOUNTAIN OF HAMPSHIRE, VA.

From Kercheval's History of the Valley.

This most extraordinary and wonderful work of God's creation certainly deserves the highest rank in the history of the natural curiosities of our country. This mountain is washed at its western base by the North river, a branch of the Capon. It is not more than one quarter of a mile north of the residence of Christopher Heiskell, esq., at North river mills, in the county of Hampshire, 26 miles north-west of Winchester. The west side of this mountain for about one mile is covered with loose stones of various size, many of which are of a diamond shape. It is probably 600 or 700 feet high, very steep, and presents to the eye a most grand and sublime spectacle.

At the base of the mountain, on the western side, for a distance of about one hundred yards, and ascending some 25 or 30 feet, on removing the loose stone, which is easily done with a small prize, the most perfectly pure and crystal looking ice, at all seasons of the year, is to be found, in blocks of from one or two pounds to fifteen or twenty in weight. At the base of this bed of ice a beautiful spring of pure water is discharged, which is by many degrees colder than any natural spring water the author has ever seen. It is believed that its natural temperature is not many degrees above the freezing point. Very near this spring the owner of the property has removed the stone, and erected a small log dairy, for the preservation of his milk, butter and fresh meats. When the author saw this little building, which was late in the month of April, the openings between the logs, (on the side next the cavity from which the stone had been taken out,) for eighteen inches or two feet from the floor, were completely filled with ice, and about one half the floor was

covered with ice several inches thick. This is the more remarkable from its being a known fact that the sun shines with all its force from eight or nine o'clock in the morning until late in the evening, on the surface covering the ice, but the latter defies its power. Mr. Deevers, who is the owner of the property, informed the author that milk, butter, or fresh meats of every kind, are perfectly safe from injury for almost any length of time in the hottest weather. If a fly venture in, he is immediately stiffened with the cold, and becomes torpid. If a snake in his rambles happens to pass over the rocks covering the ice, he soon loses all motion, and dies. Christopher Heiskell, esq., informed the author that several instances had occurred of the snakes being found dead among the rocks covering the ice. An intelligent young lady at the same time stated that she had seen instances of this character. In truth, it was upon her first suggesting the fact, that the author was led to make inquiry of Mr. Heiskell. And Mr. Deevers stated that he had several times removed torpid flies from his dairy into a more temperate atmosphere, when they soon recovered life and motion, and flew off.

Nature certainly never formed a better situation for a fine dairy establishment. But it will probably be asked by some persons, where is the milk to come from to furnish it? The time will probably come, and perhaps is not very distant, when our mountains will be turned to good account. Their sources of wealth are not yet known; but the spirit of enterprise and industry is abroad, and the present generation will hardly pass away before the most astonishing changes will be seen in every part of our happy country.

ON THE USE AND VALUE OF LIQUID MANURE.

From the Mark Lane Express.

I was first attracted to the value of liquid manure when on a visit to Baron Biel, in Germany, (the Sir Charles Bunbury of that country,) by seeing two carts constantly at work on his land, carrying out the liquid drained from a large number of cattle feeding on the refuse of wheat, from which brandy had been distilled; and by hearing from himself the great benefit his land had obtained from the use of it. Immediately on my return home, I put his plan into execution on a small scale, in the following manner. I had a well sunk as deep as I thought was necessary to receive the drainings of a yard, in which about twenty horned cattle, as many pigs and seven cart horses (besides colts and calves) were kept; having rather a fine grating at the mouth of the drain where it emptied itself into the well. A wooden pump was put into the well, which raised the liquid into the cart with very trifling labor by the addition of a conducting spout, and I am not aware of ever having seen obstruction from filth, as your correspondent complains of in this simple operation; neither was my well cleaned out for the space of several years. The machine for carrying this liquid to the land was of this description. I first purchased the fore axle-tree and wheels of an old bread wheeled wagon. I then had a water cart made, exactly on the principle of those used to water roads, which it requires two horses to draw when full. The expenses of the well (which was bricked,) the axle-tree and wheels, and the body cart, as near as I can recollect, twenty-two pounds. And now for the effect. This will be best shown in one single instance. I had a meadow of six acres, so much out of condition that the laborers absolutely refused cutting one year. By the application of this liquid, alone, it was, *the next year but one*, as good as any other on the farm. It told equally on other grass land, and I would have used it on my other farm, had the locality of the buildings been convenient for securing the draining from the stalls, stables, &c. I never applied it to ploughed lands, having always an abundance of yard manure from horses summered in the stable, besides other regular sources; but the bailiff of the late Mr. Chate, of the Vine, (master of the Vine foxhounds,) who followed my example, did apply it to his hops, and occasionally to naked fallows with very good success.

As to the test of its strength, which your correspondent inquires about, I had no means of obtaining it; but I considered it to be strongest when darkest in color, and smelling very strong of the stalls also in dry weather; and I like to see a scum on the top of the well showing that a degree of fermentation was going on.

NIMROD.

St. Pierre, near Calais, Jan. 28th, 1840.

TO DESTROY THE STRIPED BUG.

From the Cultivator.

Mr. Wm. Youngs of Lyons, informs us of a more feasible method of destroying the striped bug which infests melons, cucumbers, &c., than that described by Mr. Wilson in the last Cultivator. It is to place a turkey, with her brood of young, in a coop in the garden, just as the plants appear above ground. The young ones will live on the bugs, which they eat with great avidity; but the old one in the coop must be fed her usual meals. The turkeys must, after destroying the bugs, be removed from the garden before they become so old as to prey upon the setting fruit.

THE DISPOSITION TO FATTEN OF DIFFERENT BREEDS OF HOGS.

From the Western Farmer.

To be able to decide, as nearly as possible, what particular kind of hog, of all those imported into this country from other countries, as well as the productions of these by crossing them with one another, has the readiest disposition to fatten, is a point of very great importance and interest. Although we have not, at present, any statements from agriculturists and stock raisers in the western country upon this particular point in hogs, yet we have from foreign sources, and from other parts of the country, some data upon which to found a few pretty certain conclusions on this subject: and until we have further information in this matter, from those farmers who may be curious and patriotic enough to make the necessary experiments, we will content ourselves in laying before our readers all our knowledge derived from foreign

trials of this kind, and from some acquaintance we have had with swine in England. In the first place it is hardly necessary to mention that the *Chinese* hog has been always *distinguished above all other breeds by its peculiar aptitude to lay on fat;* but owing to its being but a poor breeder, the pure breed is but little cultivated. Of this breed there are two nearly distinct kinds, the *white* and the *black*. There is also a *mixed breed* of this kind, being spotted and mixed black and white; some of them have prick ears, like the true breed, and others have ears round at the ends, and hanging downwards. These are coarser than the former, but they, unlike them, are remarkably prolific, are good nurses, and will, with proper care, bring up two litters within the year. They are, however, not good store pigs, rarely attaining any great weight, and *much more difficult to fatten* than the original stock of the Chinese breed.

The next in order of fattening propensities, after the true China breed, either white or black, seems to be the *Woburn* or *Bedford breed*, a new variety introduced by the Duke of Bedford. They are of various colors, well formed, hardy, very prolific, and have attained to nearly twice the weight of all other hogs, except the Chinese and Berkshire, within the same given period of time—and even the Berkshire they have surpassed to some not inconsiderable amount. Then, as almost universally admitted, follow the *Berkshire*, too well known to require description. These crossed with the Chinese have produced a race possessing some excellent fattening and other good qualities, and are known in England as the *Tonkey breed*. The Berkshires are dispersed over the whole of England, and have therefore varied both in form and color; but the best are in the neighborhood of Tamworth, in Staffordshire, from the famous *Tamworth Boar*. The crosses also from this breed are very numerous in England, and are highly rated in their different districts. After the Berkshire in kindliness of fattening, must be rated the *Essex half black pigs*, raised by Mr. Western, of Felix hall. They are short haired, fine skinned, smaller head and ears than the Berkshires; short snubby noses, very fine bone, broad and deep in the belly, and full in the hind quarters; the sows are good breeders, but they are not near such good nurses as the Berkshires. The *Lincolnshire* rank next, and in point of profit are hardly less than the Essex. They are white, and rather tender. This breed is much the same as the *Norfolk* and *Suffolk*. The *Sussex* breed is smaller than the Berkshire. It is a variety of the Essex, and is a very valuable kind of hog. It may be classed next in order for fattening properties, and what is deserving of notice, arrives at maturity sooner than any other kind. The *Hampshire* fatten kindly to a very great size and weight. The *Northampton*, *Shropshire* and *Yorkshire*, are of large size, but fatten more slowly. The Cheshire are the largest hogs except the Rudgwick, which is the largest in the kingdom of Great Britain. The Essex and Hertford breed, as it is called, has taken premiums from the London and Smithfield cattle club, and is held in high estimation. We then classify the different breeds for fattening propensities (until we are further informed by sufficient comparative experiments) in the following order:—

1. The Chinese.
2. The Woburn, or Bedford.
3. The Berkshire.
4. The Essex half black.
5. The Lincolnshire, &c. &c.

We ought not to omit to mention that the Neapolitan stock of swine have a very great aptitude to fatten. In the meanwhile we copy from the Franklin Farmer, the following interesting letter from Samuel D. Martin, Esq., of Kentucky, on this subject, and it would seem that as far as his friend's experimen's have gone, the Woburn breed of hogs, as we have stated, stand pre-eminent in that most valuable characteristic—quickness in taking on flesh.

A proposition to test the relative disposition to fatten, of different breeds of hogs.

The hogs raised and fattened in Kentucky, it is believed, amount to more than two millions of dollars annually, and consume in the raising and fattening more than a million of bushels of corn, besides rye, oats, wheat, and grass.

It would be of great value to the state to have such experiments made as will test the value of the different breeds, and ascertain which is the best machine for turning our surplus grain into meat.

Some hogs will make double the quantity of meat out of a given measure of corn that will be made by others. Therefore it must be very plain, that the persons feeding bad breeds must suffer considerable loss. No man should keep a bad breed when he can get a better. But it is to be regretted that sufficient experiments have not been made, to determine *clearly* which is the best breed.

I have made some experiments between the two most valuable breeds that I have, but they were not conducted so as to be clearly satisfactory. I put two Berkshires and two Woburns into the same pen, and fed them together. The experiment resulted in favor of the Woburns. But they were all fed in the same trough, nor do I know what was consumed by each.

In a trial lately made by William and Isaac Barclay, of Jessamine, between two boars, the Woburn gained fifty pounds more in thirty days than the Berkshire. But here again we have no account of what each consumed. The trial was made for the reputation of the stock, and it is presumed that both had as much as they would eat.

For the purpose of making a set of experiments that will be satisfactory, I would propose to the advocates of other breeds, to furnish Woburn hogs or pigs, barrow or sow, to be fed by some disinterested person, in such a way as to ascertain which will come earliest to maturity, fatten easiest, consume the least food, and travel best to market.

I would propose that two or three pigs be fed upon a certain allowance, and that the balance shall have as much as they will eat. That they be kept in separate stalls, and an exact account be kept of what is consumed by each one. To be kept in this way until they are ready for market, and one of each kind be sent to our most distant market, weighed at starting, at the journey's end, and after they are dressed. The balance to be sent to our nearest market, weighed before starting, and upon reaching the place have their gross and neat weights ascertained.

If my proposition should be accepted, each person to pay the proportion of the expense of the experiment.

If the above proposition is not accepted, I will feed a Woburn barrow, sow, or pig, against any other hog in the state that has no Woburn blood in it.

No proposition that has any thing like a bet or wager attached to it will be accepted by me, but I wish to feed to ascertain what the different kind of hogs will do. S. D. MARTIN.

BONES AS MANURE.

From the Quarterly Journal of Agriculture.

Mr. Watson procured bone manure for two acres of land, the greatest quantity being 25 bushels per Scotch acre. "This," says he, "I applied the following turnip sowing season on a sharp black land, and on two adjoining acres of the same field, I applied 25 cart-loads of well-made farm-yard dung per acre: the season of sowing was rather wet, and not very favorable to the growth of turnips. Those with bones came above ground on the third day, very dark-colored and broad in the leaf, and by the tenth day they were all in the rough blade; at this time I examined the state of the bone manure, and found it in one mass of maggots; but two days after, they were all dead, and the weather being now dry and warm, the most rapid vegetation I ever remarked took place, so that by the fifteenth day from the time of sowing, the turnips were fully strong for being thinned. The plants where the farm-yard dung was applied, did not come up until the fifth day, and the turnips were twenty days sown before they were fit for thinning, and by this time the bone turnips were meeting on the top of the drill, and they continued to maintain the advantage of their first start, until the month of September, which set in rather dry. At this time I anticipated that the bones would be exhausted, and the crop stop growing, but such was not the case, for while the dunged crop began to fade and stop growing, the bone turnips kept growing vigorously. About the middle of October, when I considered both crops at maturity, I had a comparative trial of their weight carefully made, the result of which was, six tons per acre in favor of the bones, they being twenty-eight tons per acre of Aberdeen yellow turnip; the farm-yard dung, only twenty-two tons per acre.

From this experiment, I was induced to extend the use of bones on my farms, growing annually from 70 to 100 acres of turnips, with this manure, *which gives me a great command of dung for my other crops.* I have erected machinery for grinding bones, my neighbors having now all become convinced of their great superiority, and the first season I sold to the amount of £1500 sterling worth, and the last season not less than £10,000 sterling has been paid for bones used in the district of Strathmore, a great part coming from Hull.

The quantity of bone manure may be varied from 15 to 25 bushels of dust per acre, according to the state of the land, the driest soils being the most benefited by their use; some difficulty was at first experienced in depositing the crushed bones, so that the plants might reap all the benefit; but this is now obviated by the application of a hopper and trough to the turnip-drill, which conducts the manure and seed into the drill at the same time, and with the same expedition as sowing the seed by the old machine.

Doubts had been raised whether the succeeding crop of oats or barley is in any degree benefited by the small quantity of bones used in growing a crop of turnips. I can confidently state that, on my farms, both the quantity and quality of my barley particularly have been improved, and the grass from seeds sown with it is a fortnight earlier in its growth than after other manures.

In the crop of 1825, the bone manure was a great blessing to the breeders and feeders of cattle in this district, and, in some instances, saved the industrious tenant from ruin; for the severe drought, even of that season, did not prevent a crop of turnips with bones, while all other manures failed, and it was thus the means of bringing through that disastrous winter, herds of cattle which must otherwise have perished for want of fodder.

IMPORTANCE OF MANURE. KLIYOGG THE SWISS FARMER.

From the Farmers' Cabinet.

Sir—A friend has put into my hands a book, recording the history of a remarkable individual, a Swiss farmer, by the name of Kliyogg: it was published forty years ago, but it contains instruction and information, with food for reflection, which will be ever new and of the highest interest to every practical agriculturist; and I therefore feel a great desire to copy a part of the first chapter, "on the value and importance of manure," which will, I conceive, be read by a very great portion of your subscribers to much advantage, and be the means of leading us all to reflect, how little of the value and importance of that chief agent in agriculture is yet known or cared for.

Kliyogg's family consisted of a wife, a brother and his wife, and their two families of *eleven children*, all, except one daughter, mere infants. His farm, of eighty-four acres of cleared land, was so poor that it would support but three oxen, four cows, one horse, and two hogs—in all, but ten head of live-stock—but, from this wretched little impoverished spot, he contrived to procure the means of subsistence for such a numerous *colony*, and eventually *riches*—but here commences the chapter "on the importance of manure."

"It is not from grazing, therefore, that Kliyogg expects advantage, but from an article of more advantage, and more to be depended upon, *the increase of dung for manure.* He finds his horse more expensive than serviceable, and determines to sell him and buy oxen with the money, as he computes that two oxen may be maintained for one horse. The advantages which he derives from his cattle are, milk, butter, work and manure; the last article, *manure*, he considers as the basis of the improvement of the soil; consequently, he has applied the whole force of his care and industry towards its accumulation, and has so well succeeded, that from his small number of cattle, he collects yearly about a hundred loads,

which is double the quantity which he collected the first year of his farming; and this has led him to conclude, *that the generality of farmers have too great a proportion of live-stock to their land!* This conclusion appeared to me, at first, very extraordinary, and almost tempted me to consider him a man of paradox; but his explication of this enigma satisfied and undeceived me, for, said he, "when a farm is overstocked, the owner is forced to send his cattle, in the summer months, to graze on waste lands, at a distance from his house and their sheds, which is the loss of so much to the farm-yard; for as the poverty of these waste lands reduces their milk, to remedy this defect, the manger must be filled with fresh grass, when they are brought home at night, which necessarily diminishes their winter store of provision; scarcity of hay must imply a call for straw, which ought to be entirely appropriated to the dung-hill, as, without it, no improvement of soil can be expected; and besides which, bad food is the source of an infinite variety of distempers." And in this way he pointed out most judiciously a principal cause of deficiency in the agriculture of the country; for it is a fact, that many of our farmers keep more cattle in the summer than they can conveniently support in the winter; the arable and meadow lands are, by this bad management, deprived of that part of the manure which they require: the cattle, enfeebled for want of wholesome nourishment, particularly towards the spring, lose their milk or their laboring strength, and frequently die of diseases easily accounted for; and these are truths, which *experience* too well evinces. He therefore keeps no more live stock than he can amply support with grass and hay from his own fields; the straw is carefully preserved and used only for litter, of which he is so liberal in his stalls, that the beasts are buried with it to the knees. He is attentive also to gather all the dried leaves, moss, rushes, &c., from his land, that can in any way serve for litter; the small dead boughs and pointed leaves of fir-trees in particular, afford plentiful materials for this purpose, and he employs in this occupation the greater part of the time he can spare from his other work.

A compost dunghill appears to him an object of so great importance to the improvement of land, that of all branches of labor he regrets the want of assistance in this the most, and waits, as a singular blessing, the time when his children shall be capable of contributing their share; for so thoroughly is he persuaded that he wants only laboring hands to procure *fifty loads more of manure, without increasing the number of his cattle!** In prosecution of this *great design*, he goes in the autumn into the woods with a hedge-bill, or hook, to prune the supernumerary branches of fir and pine trees; even of those which he thinks it useful to leave, boldly venturing to cut the lower shoots of the young trees close to the trunk; these he binds into fagots and carries home, placing them under a shed, till a proper season for prosecuting his work; and at leisure hours, and especially in long winter evenings, he prepares these fagots for the purpose intended, an employment so little disagreeable or fatiguing, that it serves him for *recreation*. He begins by cutting the small branches away from the larger ones, laying them, with the pointed leaves of these trees, in little heaps, to be used for litter, while the larger and tougher boughs are reserved for fuel; by this method he *amasses* many proper materials for good manure, that are commonly suffered to rot uselessly in the woods, which is so much real loss to husbandry! *To Kliyogg this discovery is an inestimable treasure*, of which we were either ignorant or forgetful; and this opinion is farther verified in the husbandry of the canton of Appenzell, where they scatter dead branches of fir and pine trees in great roads, to be trampled upon by cattle and passengers, by which means they acquire a beginning of putrefaction, and are converted into manure, though, it must be confessed, of a very indifferent quality; but Kliyogg, who had experienced how defective this method was, has succeeded in what at first seemed hard to accomplish, namely, converting these very materials into excellent manure. And although it is known that resinous and aromatic juices, contained in the prickly leaves of pines, are powerful enemies to putrefaction, yet, what obstacles are not to be surmounted by reason, aided by industry! He subdued them all, by observing certain rules in the preparation of litter for his cattle, *and of the different strata of his dunghill.* He does not remove the dung from under his cattle under a week, strewing fresh litter upon the top every day; this method he does not find injurious to the health of his cattle, nor does he think it prevents cleanliness, if a constant supply of fresh litter be added. His exactness is conspicuous in the management of this litter when taken away, for it is placed in separate layers upon the dung-hill, and so methodised, that those where the fermentation is soonest to be expected, may accelerate the putrefaction of others where it is more slow; he therefore, in the beginning of autumn, litters his cattle with straw during two months; the next two months he litters them with twigs and spines, or pointed leaves, from fir and pine trees; then straw again, or rushes or dried leaves; then twigs, spines, and so on alternately.

The *regulation of his compost dung-hill* is as follows. Lest the fermentation should be totally suppressed, or even checked by drought, he is assiduously attentive to the preservation of a certain degree of moisture, knowing that to obtain a manure thoroughly rotted, he has nothing to do but to preserve a constant fermentation by frequent waterings; and to facilitate this, he has sunk, near his dunghill, seven large square pits, which are planked with wood in the form of boxes, and in these he keeps the *prolific* water essential to so many operations; first, putting some thoroughly fermented cow-dung at the bottom of his boxes, he pours in a pretty considerable quantity of *boiling water*, and then fills up the pit with fresh water from his well; this brings on, in three weeks, a state of putrescence, which, without boiling water, could not be attained in two months; he has thus a supply of corrupted water, as well for the purposes of vegetation as to keep his dung-hill in a constant state of humidity. His reservoirs of stagnant water are sunk below his stalls and stables, with the view to convenience, and there is likewise a trough at the declivity of the dung-hill, to

* Will our Jersey friends, residing in the midst of the inexhaustible marl-beds of that highly favored region, reflect on these things: *fifty loads additional in the course of the year!!*

receive the water that runs from it, and this gives an easy opportunity of moistening the dung-hill frequently, without robbing the soil of its share of the stagnant water. And the success of this method of watering his dung-hill suggested the idea of putrefying small twigs of fir and pine, without using them for litter; he lays them in close heaps, pressed down and covered with earth, to prevent evaporation, and pours stagnant water upon them every day, until they are converted into *rich mould!* But he does not bound his improvements within the circle of that quantity of manure, which his industry procures from his small number of cattle, *for he buys every year seven loads of dung from his neighbors!* and these he mixes with six tons of peat ashes; and he finds the effect of these two kinds of manure answerable to his expectations."

Now, how strangely will it appear to many of your readers, who witness daily and hourly the waste of thousands of loads of the finest manure, in the washing from cattle-yards; the rich soils which might be obtained from river and road-sides; the cleanings of ponds; the openings of pits and quarries; and more especially, the waste of winter-bedding, in the shape of stubbles from the different crops, which are often left standing in the fields knee-deep, because of the weeds or grass contained in them, which ought to be sacrificed, rather than lose a foot in height of the stubbles and cords of dung in the cattle-yards! How strange will it appear to such, I say, to hear a man regretting that he is deprived, by the want of assistance from his young and helpless family, of making an additional *fifty loads* of compost in the course of the year! and rejoicing in the *inestimable treasure* contained in the spikes and leaves and branches of his pine trees, which he trains up by candle-light in winter evenings, by way of *recreation!* And after the inestimable *treasure* which he obtains from this source of his *discovery*, to find him *absolutely* a purchaser of manure, to the amount of *seven loads* per annum, of his neighbors! If the perusal of the above history will not move us to be up and doing, in the way of collecting the means of improvement contained in the mines of wealth with which, in this country, we are surrounded, and in some situations absolutely *choked with*—witness our ponds and ditches around many of our cattle-yards—I know not what will ever be sufficient to *move* us, until we are moved off the stage of life by the rising generation, which seems to be springing up for the purpose of correcting the errors of their fathers, more particularly in this respect than in any other; for it must be admitted that there is too much truth in the observation, "to the young it is that we are to look for improvement." STEPHEN GIBSON.

ERADICATION OF WEEDS.

From the Farmers' Cabinet.

Sir,—You have been adding line upon line, and precept upon precept, in the pages of the Cabinet, on the necessity of keeping crops free from weeds, showing that the land *will* produce a crop of *something*, depending, however, upon the will of the owner what that shall be, whether of thistles, rag-weed, corn or grain; and I cannot but call the attention of my fellow-readers to the consideration of a subject of the highest importance, but which seems least of all to have obtained the care of the husbandman generally. The truth of the above is strongly exemplified in the present state of the crops of multicaulis, wherever they have been neglected and left to shift for themselves, which has been very much the case in this, the day of their humiliation, throughout the country. All will remember the encomiums which were lavished upon this crop, even so late as the past season; that they would "flourish *any* where, and under *any* circumstances," was a part only of their peculiar properties, but their present appearance convinces us that they depend, in a very great measure indeed, for their good looks and abundant foliage, upon good food and superior cultivation, for wherever this has been withheld, their state is wretched in the extreme. I saw, yesterday, an acre of these trees, which had been planted in the spring, and have never since been cleaned; the result is, the weeds are taller and stronger than they, and a thousand times more abundant, with bushels of seeds, ready to shed and sow the land for seven years to come, while the foliage of the morus, instead of being of that large growth and deep green hue, is small and mean, and the color of a peach tree in the yellows—no longer fit for *pies or tobacco!*

This is a lesson which ought not to be lost upon us; it furnishes a means of calculating the value of clean cultivation; and without such ocular demonstration, few of us would have ever been able to form an estimate of the vast difference, which really exists. I declare for myself, that I have never before seen the evil of neglected cultivation in the light that I now do, nor can I believe that my neighbors understand, even at the present time—with a crop of weeds five feet in height, and of proportionate substance—to what a degree they are robbing their crops of their proper nutriment! And if it be true, as has been often said, that a "single root of grass amongst wheat has been found to draw a portion of the nourishment from *six* plants of the wheat," it is only to be wondered, that some crops continue to get any at all, when buried beneath a covering of them as high, oftentimes, as the fences!

Adjoining the field containing the multicaulis trees, and upon exactly the same quality of land, is a large breadth of sugar-beet of remarkable size and most luxuriant growth, but they were planted in rows at a proper distance, and have keen kept perfectly clean; and while the morus has *turned to a crop of weeds*, here the crop is *beets*, which will give from fifty to sixty tons per acre! Now, to have converted these into a crop of weeds, it would only have been necessary to permit *them* to take possession of the soil and keep it, and the end would have been accomplished. As it is, it does one good to calculate the quantity and value of the manure which this crop will yield on being fed the coming winter—far greater than the whole expense of raising the crop—to say nothing of their value as food for stock during that trying period! It is quite unnecessary to add that the person who owns this crop is not the owner of the morus; his crops are uniformly large and heavy, *because* they are kept clean from weeds.

It is calculated, and I believe the estimate is far too low, that a heavy crop of weeds consumes at least one-half the dung that is applied in pre-

paration for a crop of grain—how pleasant it is, then, to reflect that while I am carrying manure to my four-acre field a mile off, one-half my dung and labor goes to support the weeds, and one-half the remainder is lost in the diminution of the crop in quantity and quality, or thereabout; this is tithing the crop with a vengeance, and would never be submitted to, did not farmers believe that crops "won't pay for cleaning!" But, if this were the fact, what a losing concern must be the growing of a corn crop which is so expensive in every stage of its growth! and yet, none of us hesitate to perform it, or are afraid to debit the crop with the cost, which it is always sure to pay, if the season is favorable. Is it not, therefore, passing strange, that any one should be so perverse as not to see, that if *corn* will pay for superior cultivation all other crops *must*, and especially potatoes, a crop that is generally devoted to the weeds at some period of its growth, although none perhaps suffer more from their presence, particularly in quality: and this remark is exemplified in a crop of these, which is now growing in an adjoining field, where my neighbor Dale gave up the cleaning *for a bad job*, when he had got through about half the piece; they were of an early variety, and he is now taking them up, but it is really a caution to see the difference which there is between the upper and the lower ends of the patch; they appear upon the part which was allowed to go to weeds, of quite another kind, even in their form; worm-eaten, scabby, and covered with tubercles; and, on boiling, are watery, comparatively fit only as food for hogs, and about half the size of those upon the cleared land. Now it must not be forgotten that there is a *small condition*, appended to the promise, "in due time ye shall reap," it is, "if ye faint not." My neighbor fainted at half-way in his war upon the weeds, and his crop of potatoes became *a crop of weeds*, so thick and high, that he was compelled to mow them with a scythe, before he could see where to put in the space, the very rows being obliterated; and the crop in quantity is equally deficient. On my reminding him of the common observation, "crops won't pay for cleaning," I was pleased to hear him say, "I'm now satisfied they won't pay for neglecting, any how."

But I owe honorable mention of the management of the person who owns the sugar-beet above noticed. Nothing is so common as to see the headlands of the corn-crop full of the largest and stoutest weeds, no care being taken to clean them, even by mowing, after the last cleaning of the crop; now here is an exception to this almost universal practice, for, at that time, he turned about and ploughed them down, and sowed the land with buckwheat; and the view at this time is absolutely lovely, the plant in full bloom, and remarkably strong and vigorous—for every one knows that the headlands are always the richest portions of the field—and promise a crop sufficient for the support of the farm household during the coming year. No fear of *this* man's crops *turning to weeds*, but it is quite amazing to see the fine crops of these, which are repaying his *neighbor's* care of them, to the value of cent. per cent. R.

September 16th.

TRENCHING.

From the Farmers' Cabinet.

Sir,—The best managers are always to be found in the most unfriendly soils and situations—witness our friends in the eastern states, *the Scotland of America*—so true is it, that "In countries where nature has been bountiful, man has been indolent, where she has been niggardly in her gifts, the deficiency has been more than compensated by the industry of man."

In the "Survey of Aberdeen," there is the most surprising account of what has been done in the way of trenching their soil in the neighborhood of the town of Aberdeen, and which does indeed go to prove the truth of the above observation! It is remarked, "The greater part of the land in this vicinity has, from the most barren and unproductive state, been thoroughly improved by *trenching:* not less than three thousand acres have been trenched within three miles of Aberdeen, and in all places of the county considerable additions have been made to the arable, by trenching the barren lands. It is practised on land which abounds in stones of different sizes, sometimes when the soil is dry, and in other cases when it is wet, and then it is united with under-draining: it is practised when the object is to deepen the soil or to mix a portion of the subsoil along with it; when the subsoil is *tilly* or very tenacious, as well as when that next the surface is unproductive, mossy or exhausted by over-cropping; and lastly when the land is *foul*, when cleaner and stronger soil can be brought to the surface.

"The expense, it must be confessed, could not have been borne in many cases, if the *first crop*—for so it may be called, as it covered the *whole soil*—that was raised by the spade and mattock, had not produced from thirty to fifty pounds per acre: this was a crop of granite stones, which was sold for paving the streets of London! But, after all, the ground that was thus gained to the community would not have been able to recompense the cultivator, if a mixture of the spade and plough husbandry had not been introduced. The rent of the land in the vicinity of Aberdeen is extremely high, being now, on a lease for years, from five pounds to ten pounds sterling per acre, and, in a few cases, not less than eighteen pounds! Yet all this is necessary to remunerate the improver, who trenched, dunged, limed, and cultivated this thin soil, and which must still be frequently manured. It would have yielded too little produce if tilled only by the plough, and would have been cultivated at too great expense if the soil had been constantly dug with the spade; a medium between these two—either the alternate use of the plough and spade, or at least a mixture of plough and spade husbandry—was thus introduced by *necessity*, and has been attended with the happiest effects."

With little exception, the whole tract of country from Seville to Antequera, in Spain, although of the *richest possible description*, is in the most wretched state of cultivation; no enclosures, and such is the state of personal insecurity, that no farmer or proprietor ventures to reside on his own land!

THE NEW THEORY.*

From the Journal of the American Silk Society.

Cambridge, E. S. Md., Sept. 28, 1840.

Gideon B. Smith—Dear Sir—In your 'Silk Journal' of August last, you maintain that the silk-worm "requires exactly twelve months to pass through the various stages of its existence;" "that, if hatched on May 1, 1840, the eggs produced must be hatched on May 1, 1841, or nearly so;" and that otherwise, if hastened, or protracted, disease and death must be the consequence to the new progeny!—and you believe that analogy will sustain the opinion. (1)

This, indeed, is a grave and serious subject, out of which grows a question of deep concern to the country at large; and more especially to those whose sanguine and ardent spirits may have led them to embark heavily in the design of this new enterprise; buoyed as they were, by the new discovery of protraction, and multiplication of the crops, at pleasure; which would, if established, add seven-fold to the profits of their labor.

"Silk-culture," if nothing more than one crop can be produced in the season, will be a poor business; and nothing more than one crop will be attained, if the above sentiment be correct; the difficulty of procuring stocks of eggs, of the precise age for every respective crop—and the frequent impositions which will be practised by unprincipled vendors, will be quite insuperable; and one crop only, as in Europe and Asia, will be the whole practicable result.

The difference which this counter discovery, or new position will make, in our prospects of the silk culture, below that of the *many* crops, is incalculable, and unquestionably fatal—if true; the cost—labor—and leaves will be nearly seven to one greater, than if *seven*, the supposed practicable number of crops under the previous discovery could be accomplished—the same rooms—fixtures, and other accommodations must, in such case, be made for one million, as in the other for seven millions; the foliage to be supplied wholly in the space of a few weeks, will require uncountably more trees than were as many months allowed for them to *leaf* and *releaf* for each and every crop through the season; the labor being all required at *one time*, will be very troublesome, and costly to Maryland—and to all those spacious and very suitable regions, south of the Potomac and Ohio, where *annual*, and not *daily* labor is generally employed; an immense number of laborers must in this case, be reserved for about two months' services—before and afterwards, through the year, a cumbrous tax, not always to be disposed of, at seasons when every trustworthy farmer has his supply. (2)

Hence, an inquiry into the merits of the new theory, and the grounds on which it rests, becomes highly interesting.

I grant, it is strange the important discovery of Mr. Carson, "that the hatching of silk-worm eggs, may be a long time protracted without injury to the progeny, had never been made in Europe or Asia, where that culture had so long been a prominent occupation"—yet, equally strange it is, that many all-important discoveries and improvements in the arts and sciences are daily developing, which had remained hidden to the eye and mind of man from times unknown; we must approach the subject, then, without the prejudice of interest or novelty.

You adduce a case in analogy of the "swallow martin" seeking a suitable climate, at a particular season, as an instance in point—this case is not, in my opinion, applicable; instinct prompts the bird, by the *instrumentality of its feelings*, to seek a new domicil, as a dog would remove from an overheated fireside, to a cooler part of the room; volition is here involved; the eggs of the worm do not come into action by instinct—by this motive the *worm* may *deposite them*—but they must await the essential and unerring power of heat, for their developement; until this be applied, they are, (other injuries excepted)—*quasi new;* a fact well known in the New York establishments for the purpose, where all sorts of eggs, without regard to the dates of their deposite, are, if sound, hatched, and produce good progenies. (3)

The "American locust"—your other case of analogy, I consider equally remote; very truly, it may perform the septennial revolutions, from the date of its eggs, having received the influence of a sufficiency of heat to bring them into life; which, when the parent has made its deposite at the approach of the vernal sun, will occur in regular order—unless, by accident or design, this vivifying cause be intercepted; in which case the effect will, of necessity, be retarded, and possibly to another year, or more; and in proof of this occurrence, annually are seen many stragglers, not moving in the natural and septennial cycle; and it has not been shown in the case relied upon, that these, or the product of the eggs of *these stragglers*, would be diseased, or perish; which, as I understand, is the very gist of the question it is adduced to settle; and, therefore, it is not in point. (4)

In regard to the question at issue, entomology is so little studied, that more light is to be drawn from the vegetable, than the animal world; and it would seem superfluous, with the most of your readers, to premise the fact of the very great analogy, in a physiological view, which oviparous insects in general bear to plants, and particularly in the production of their progeny, from *seeds* and *eggs;* a subject clearly and scientifically treated in Darwin's Phytologia—and elsewhere.

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* In a previous number of the 'Farmers' Register,' we presented the new theory of Dr. Gideon B. Smith in regard to the retarding of the hatching of silk-worms' eggs, as well as the remarks of one of our most experienced and intelligent silk-culturists approving thereof in advance. We now add some objections as well as answers thereto, so that our readers may have the best opportunity for hearing opinions, both *pro* and *con*, on this novel and interesting subject. For our own part, we can only say, as yet, that we heartily *wish* the new theory may be sound; as the knowledge of any certain and general causes of failure of eggs, and consequently of rearings of silk-worms, will bring culturists so much nearer to the certainty of success in rearing hereafter—a result which we do not appreciate the less, nor less anxiously desire to be produced, because the events of this year have served greatly to lower our previous confident hopes and expectations.—Ed. F. R.

Instances of the dormant state, in which the seeds of the plants may remain for many years, and without injury to their final production, are numerous; and daily instances occur of the seeds of plants dug up from depths beyond the reach of atmospheric and other vegetative influences—dormant and unimpaired; the vital principle, though sleeping, had resisted their decomposition, and was ready to receive the impulse to a future and healthy life. Clover seed has been known to vegetate and flourish, after a sleep in the bowels of the earth, for twenty years or more. Grains of wheat, it is well authenticated, have been taken up with mummies, from the catacombs of Egypt, after a lapse, probably, of as many centuries, and have vegetated, and yielded a healthy product.

In truth no physiological fact is better established, than the indefinite dormancy of the seed of plants, while deprived of the influence of the agents of vegetation, and the revival upon their admission into a full and healthy action.

From the period of the elicited spark of actual life—and of the partial performance of physiological functions—the date of the term of its vital existence commences whether that term be one, or many years; or dependent on future physical agencies which may control it. (5)

In this class of animals—the oviparous—few observations have been made on this point. Yet the general analogy before alluded to, and the similarity of principles, under a similarity of circumstances, may justify similar conclusions.

The diverse terms of life, in animals and vegetables are dependent on their various and respective structures, adjusted for their growth and consumption; and the period necessarily commences from that of organic effort; before that time, none of its structure being called into action, no portion of its physical being can be impaired, or its duration shortened; and the entire term (if any) allotted by nature, will take date, not from the *sleeping*, but from the *excited* or *actual life;* from this term it had begun to grow, use its energies, and consume its term of vital existence. These remarks are necessarily not applicable to the viviparous animals, whose embryon is not dependent on casual, or extrinsic warmth, or other agencies;—its evolutions begin and progress with regularity, from its first inception, the embryon of the seed, and that of the egg, it is well known, sleep after impregnation, till excited; and as soon would I expect a lamp to burn out its contents without being lighted, as that a silk-worm egg should impair, or consume a part of its natural term, before its actual life had commenced;—when this has commenced, it cannot be repressed, or retarded, consistently with the health of the animal, and the attempt may, *a priori*—and no doubt will be attended with injury. (6)

Finally, the experiment, though accidental, of Mr. Carson, "of retarding the hatching of silk silk worm eggs, from 1837 to 1839," is conclusive; your suggestion of the *possibility* of a mistake, is nothing more than what the lawyers would call a "potentia remotissima."

Mr. McLean's experiment, which was highly flattering, made a protraction of about one month, and the progeny healthy.

My own experiment, reported by me for your Journal, made a protraction of little more than three months. In this case, the first hatching was on April 28, 1840; the third, on August 1st ensuing, from eggs of the *same identical hatching*, to wit: on May 3d or 4th, 1839, as positively asserted by the gentleman of whom I purchased them, who had a memorandum of the fact. In my report I added the following, viz: "in this case, above stated, there can be no mistake in respect to the identical age of all the eggs—they were purchased by me of a gentleman in Cambridge, my neighbor, who reared, the last year (1839) for the first and only time, a solitary crop of cocoons, and he sold to me the whole of their product of eggs; I obtained none from any other person, either before or since, or at any other time whatever."

From the whole premises, I am irresistibly led to conclude—that the new position you have taken against retarding silk-worm eggs, is erroneous, that the eggs will continue unaffected and dormant without injury, almost indefinitely, until brought within a hatching temperature; and consequently, that retarding the process beyond the usual or natural period, is practicable without impairing the health of the progeny; and that the embryon having undergone excitation, cannot be repressed without injury to the product, in a greater or less degree.

And I confidently believe that subsequent experiments will confirm the accuracy of the few already made, and above quoted; and that the general and extensive failures of the present year, may be referred to the singularly unfavorable season, requiring singularly diligent management and attention. Respectfully yours, &c.

JOSEPH E. MUSE.

REMARKS BY THE EDITOR ON THE PRECEDING COMMUNICATION.

(1) The Doctor asserts that we maintain that "the silk-worm requires exactly twelve months to pass through the various stages of its existence." What we *did* say was, that "the silk-worm, *when left to itself, exposed to the ordinary atmosphere*, hatches in the spring of the year exactly at the time the mulberry leaves open. *It is therefore an annual insect*, and requires exactly twelve months to pass through the various stages of its existence. If, for example, a silk-worm was hatched on the first day of May 1840, the eggs that it would produce would *naturally* hatch on the 1st day of May 1841." The variations, and omissions in the Doctor's quotation, and what we actually said are marked by *italics*. We were speaking of the silk-worm in a state of nature and not of its domesticated condition, or of what it could be made to do by artificial means. We inferred, however, from the fact that it was an annual insect, and thus required a full year to complete its circle of existence in a state of nature, the existence of a law of nature which could not be violated to any considerable extent with impunity. We do not pretend to assume that nature's operations may not be greatly modified by art; and we distinctly stated that by artificial means, the eggs of silk-worms might be retarded or accelerated in hatching one month without material injury. The position assumed was and is, that the precise time silk-worm eggs will *naturally* hatch, is one year from the time their parents were hatched; and the longer they are retarded beyond that time

the greater will be the injury the progeny will sustain. We shall have occasion to recur to this subject in the course of this paper.

(2) This is entirely erroneous, we think. "This new position or counter discovery" is, in the humble opinion of the writer hereof, the only means that will or can insure us the advantages of several crops of worms,—*five*, or *seven* or *seventy*, as you may please,—during a season. In the words of a friend, (whose private letter we regret we have not the privilege of publishing,)—"if true, your new theory is the only means of rescuing it, [the silk culture] from total failure; if erroneous, it is impossible for it to operate injuriously. All the inconvenience it can produce is to put cultivators to the trouble of saving silk-worm eggs three or four times during the season, instead of once. If once will do, then of course there is no use in repeating the operation; but if you have to do it six times, what does the trouble amount to? and how is it to 'prostrate' the business?" The writer of this extract is not an observer of a day or a year; he has the advantage of five or six years' experience, upon an extensive scale, and with *personal* supervision. As to the frequent impositions that will be practised by unprincipled venders of eggs, we have heretofore shown how these evils may be avoided—that is by every person producing his own eggs,—which, by the way, he ought to do under any system; for he will always, and under any circumstances, if he depends upon others for eggs, be subject to more or less of disappointment. We contend, however, that under our system there will be less opportunity for imposition of this kind than any other, for the obvious reason that the vender will be required to furnish evidence of the character of the eggs with much more particularity than he is at present. Now he is only required to say that the eggs are of a particular kind, of a healthy stock, and that they have been properly kept. Under our system he must furnish the precise date at which the worms were hatched that produced the eggs, in addition to all the above. Not only so, but he must furnish eggs of all the different dates required, and satisfy the purchaser of the correctness of those dates, and vouch for it with his own responsibility.

(3) The position here assumed is clearly untenable. If it were true that "all sorts of eggs, without regard to the date of their deposite, are, if sound, hatched, and produce good progenies," by the application of heat, *then why are not silk-worm eggs hatched the same season they are produced!* Doctor Muse must know full well, that silk-worm eggs *will not hatch* the same season they are produced by the worms, (except the two-crop kinds) and therefore that something besides "the essential and unerring power of heat," is necessary for the hatching of the eggs. It is well known that the common silk-worm eggs, though produced in June, will withstand all the heat of the succeeding July, August, and September, without hatching; and that in the ensuing spring they *will* hatch, though the temperature be many degrees lower than that they had passed through the season before. If nothing but heat were required, why did they not hatch when the mercury stood for weeks together at 80° and 90°, the season before? and if heat be the "essential power," why do they hatch in March and April, when the temperature is many degrees lower than it was in the preceding July and August? But, if the "essential power of heat" were all that is necessary to hatch silk-worm eggs, the Doctor could easily accomplish his seven crops of worms, even under the new system; for, having perfect and unlimited control over "the essential and unerring power of heat," he could hatch the eggs in a day or two after they are laid, and thus avoid all risk of injury by retarding, all expense of ice-houses, and fill his cocooneries and occupy his fixtures, seven times to his heart's content.

But *heat* is not *the* "essential power" engaged in the developement of silk-worms, or any other insect or animal, *oviparous* or *viviparous*. Heat is not life, though the latter is partly cherished and supported by the former. We believe that *time* is an essential power in the generation of all animals, oviparous and viviparous. The period of gestation required by viviparous animals in the uterus, is required also in oviparous animals in the egg. For example, with viviparous animals a certain time is required after the germ is impregnated for the embryo to mature. In the case most familiar to us all, this time or period is *nine months;* and in all animals it is fixed by the laws of nature; in some cases eleven months, and in some others five months; each genus of animals having a period of gestation of its own, and very few genera the same. But in the case of oviparous animals, this period of uterine gestation is substituted by gestation in the egg. Immediately after the germ is impregnated it is detached from the ovarium, and the gestation of the new animal commences in the egg. Now the question in dispute is, is there any *precise period* of gestation required; that is, is there any particular time after the egg is laid before it will hatch? We *know* there is; and we know that all the power of heat and all other powers combined cannot abbreviate that period. However diligently the hen may sit upon her eggs, she cannot hatch them before the precise time appointed by nature for their hatching—twenty-one days. We know that in the case of eggs, the period of gestation—we mean the time from the detachment of the germ to the hatching of the egg—may be prolonged by artificial means to a longer period than uterine gestation can; but we do not believe that the precise period has been fixed by nature for every species of egg to hatch, as certainly as has been the period of uterine gestation; and that if, by the withholding the necessary heat or air or any other essential power, the egg is prevented hatching at that period, its product will suffer more and more according to the length of time the hatching shall be retarded. If eggs of any kind can be kept from hatching any length of time desired, why can we not keep hens' eggs to any length of time we please by keeping them cold? If then a period of gestation be requisite in oviparous as well as in viviparous animals, as we contend is the case, then the eggs of all animals have a time certain fixed for their hatching; and if so, this period can neither be abbreviated nor prolonged with impunity. We do not stop to notice exceptions to the rule; with reasonable men this is not necessary in arguments of this kind. For instance, many animals whose period of gestation is nine months, occasionally terminate that process in seven, or eight months, and sometimes prolong it to ten months, and both without material injury to the offspring; but these are only

exceptions to the rule, and do not impair the validity of the law. Now if our argument be correct, silk-worm eggs have a period which they require for their maturity, equivalent to that of uterine gestation. We have already shown that they will not hatch the same season they are produced, however early they may have been laid in the season. If they do not require this period of gestation, why do they not hatch during the extremely hot weather of July and August? It is clear to our minds that they do require a certain time; but what that time is remains to be discovered. We never knew any eggs hatched in January, even in the far south, and we believe that among all the losses of eggs by premature hatching, very few ever occurred in New Orleans before the latter end of February. This would show the shortest period at which they are capable of hatching to be six or seven months from the time they are laid, or eight to nine months from the time their parents were hatched. But though, by a change of climale, their time of hatching may be thus accelerated two or three months, the same circumstance will prevent its being prolonged at all; for all the time that is gained on the one side is most surely taken from the other. We anticipate being laughed at by the Doctor for our *utopian idea* of what he will probably call ovogestation: but we can bear it.

(4) We alluded to the martin and American locust merely as illustrative of the fact of the precision of periodical developements and habits, in insects and animals. We did not rely upon them as any thing but *illustrations*; nor did we adduce them to "settle" the question. There is no proof whatever, however, that the few stragglers of the American locust, that appear occasionally, are the result of this vivifying cause, (heat,) being intercepted. In other words that they are the result of eggs retarded in their hatching. They are much more plausibly supposed to be individuals from other districts or families, that have strayed from home or been carried to their present location by high wind or some other agent. In Loudoun county, Virginia, the American locust appears at alternate intervals of eight and nine years. The Doctor would not thence infer, we presume, that one or the other of the families had been, by the interception of heat, *retarded in hatching eight or nine years?*

(5) The least tenable of all his arguments against our system is his reliance upon the analogy supposed to exist between vegetable seeds and eggs. If we admit the occurrence of "instances of the dormant state in which the seeds of the plants may remain for many years, and without injury to their final production," we cannot shut our eyes to the daily occurrence of facts of an opposite character. Indeed this opposite character is so frequently presented to our notice, that the few instances referred to by the Doctor, of an indefinite dormant state, that these latter may fairly be considered as mere "exceptions to the rule." How many instances can we not adduce of seeds that will not *bear retarding in hatching*, as well as silk-worm eggs? The white mulberry seed, for instance, every body knows, will not vegetate, if more than one year old; and coffee seeds will not vegetate if more than three months old, nor even then unless it shall have been preserved in a peculiar way. If the Doctor's pocket and patience have not suffered from the failure of *old seeds* to vegetate, he is the luckiest of the tribe of Agricola; and in that case we must beg leave to refer him to the seedsmen, who will inform him that very few of their seeds will vegetate after they are twelve months old—many indeed will not after they are six or eight months old, and in this respect imitating the habit of silk-worm eggs, by vegetating not much later than the plants that produced them the year before vegetated. So well is this fact known, that honest and careful seedsmen clear out all their old stock of seeds they know to be of this character, at the close of every season, to make room for fresh ones. Therefore, vegetable seeds, however analogous they may be to silk-worm eggs, do not prove that silk-worm eggs can be retarded in hatching much beyond the period nature has assigned for the purpose.

(6) We differ with the Doctor entirely on this point. We believe that the lamp of life is lighted at the moment of impregnation—that the vivific influence is then communicated from the parent to the offspring, in both viviparous and oviparous animals. If this were not so each individual would be an independent creation—the stream of vitality would be interrupted at each generation. This however cannot be. The vital current passes from parent to progeny, and is only dependent on heat and other external agencies, in the egg, or in the uterus, precisely as it is in the perfect animal. At no time of life can animals exist without the aid of the proper degree of heat; and they are no more dependent upon heat for existence at one time than another; nor more so than they are upon other agencies, *nutrition*, for example. But heat never imparts to inert matter the *principle of life*. The vital principle has been derived from the parent, and may be warmed into activity by heat, if before dormant, in certain cases; or this vital principle may be extinguished by a withdrawal of the heat necessary to its existence,—and it may also be extinguished by confining the egg in a temperature too low for active life, but high enough merely to permit life to exist during and beyond the period of *gestation*, when it must expire,—precisely in the manner so many millions of silk-worm eggs were destroyed during the past season by attempts to retard their hatching to a time beyond their period of gestation. From what has been said it would appear that the embryo in the egg requires nutrition from the moment of its becoming an embryo, that it becomes an embryo at the moment of impregnation; and it is no more than reasonable that it should be so. This nutrition is furnished by the albumen of the egg. It also requires oxygen, and receives it from the air—perfect exclusion from air, or the formation of carbonic acid gas, and thus destroying the oxygen of the air in the vessel containing the eggs, is certain death to them. That the embryo from its inception requires nutrition, we suppose will be disputed; for, if it does, then there can be no further question as to a limit being assigned to the term or time of its remaining in the egg, for that limit will be regulated by the supply of nutriment. To us, however, the question is clear of all doubt. All organized beings, animals or vegetables, require nutrition;—in some stages of existence more, and in some less, it is true; but in all some portion. Then may not the length of time silk-worm eggs can be kept without hatch-

ing, be regulated by this principle alone? May they not exhaust their supply of nourishment, and thus cease to live? G. B. S.

DOCTOR MUSE'S REJOINDER TO THE EDITOR.

Cambridge, E. S. Md. Oct. 7, 1840.

Gideon B. Smith, Esq.—The critical remarks with which you have done me the honour to accompany the report of my experiment on the culture of silk, require at least a short reply, which I hope you will find room for in your next Journal.

In page 269 of your September number, you have appended to my report the following notice: "if the cocoons weigh 176 to the pound, as the writer states, then the bushel of cocoons would weigh 19 lbs. to make 30 bushels contain 100,000." By referring to that, and a part of the previous page, you will readily perceive, that the *quantities*, which you have assumed for your *proportionals*, to arrive at the 19 lbs. per bushel, are not only not warranted in the text, by the remotest possibility of construction, but are actually guarded against, by explicit language: you will find it there stated, that the 'dark drab' portion of them were of the size named; but, that "the 'white mammoth' portion (so called) were *small, both worms* and *cocoons*;" then, it is wholly unjustifiable to assume in your estimate, that the entire crop were of the same large and equal size—when a *portion* of them was *contradistinguished*, from *another portion*, as *small*: indeed it required about 4,000 of the "white" to fill a bushel; and a half or more were of the "white" sort: I used this large number of the "*white*"—all that I had of them in the first crop—believing it to be an inferior variety; because, its being the first parcel I had ever undertaken, I preferred to hazard them chiefly, rather than the best, to the errors of inexperience. Both varieties I had bought of the same gentleman; and his register states, that they were hatched at the same time, and under his charge, on May 3d and 4th, 1839. The respective numbers of each portion, I considered unessential in my report; and I did not name them—equally so was the whole number of the crop, whether 65,000 as you make it, or 100,000; yet, I believe the rough estimate I made of 100,000, nearly correct.

In page 270 you quote from my report, "the doors were seldom closed—and never more than ten or fifteen minutes,"--and you ask, "is there not some mistake here, in transcribing the article?" and you continue—"you do not see how the temperature could be kept so *equable*, as is represented in the text: or how the damp air could be excluded." I aver that the text conveys no idea of a remarkable *equability* of temperature; but simply, that it was not allowed to descend below 65°: such was my order; possibly it might have been occasionally violated; yet, to my knowledge it was not; it surely was a very easy task for the manager, who was exclusively engaged in the laboratory. The rooms being plastered and close; the door in each opening into an inner passage—the temperature in the month of May, though colder than usual for the season, could be readily raised by a fire—the doors and windows closed, to much more than 65°: and thus raised the door may be opened—the windows kept closed as was in my case, and the fire continued; and as much as 65° could easily be preserved for a considerable time; the text further states, that the fire, and other parts of the process, were more frequent and longer continued, as the "damp" and "cold" seemed to indicate the necessity.

The danger of a confined atmosphere, to animal health, and life, is notorious; it is said a single candle flame will consume a bushel of atmosphere in a minute; then, it may well be inferred, that the multiplied flames of a common fire, in a closed room, of ordinary size, would accomplish the exhaustion of the oxygen, or pure principle of the atmosphere of the room, in a very short time, and render it unfit for respiration; and more especially in the case of the silk worm, whose mephitic offensive transpiration, if confined, would considerably hasten the impurity; and I owe it very much to my caution on this point, that the rooms of my laboratory were not offensive; and required neither the chloride of lime, nor any other chemical re-agent whatever.

In another note, page 271, you say, "justice to 'P.' requires that we relieve him from censure—and that you alone are responsible for the hypothesis." I intended no censure for 'P.' or yourself, but simply to offer my testimony against it, which I did not consider as censure or offence.

'P' asked the question, page 239, August number, whether *retarding* is injurious, &c. &c. and you answered it.

In your last note upon my report, page 272, you say "instead of a refutation of the hypothesis, you view it (my experiment) as going to establish your theory against retarding the hatching, as far as a single case can be expected to go.

This sentiment, I confess, surprises me; your theory maintains in your August number, page 226, that the silk worm exposed to the ordinary natural temperature, requires exactly twelve months to pass through the various stages of its existence; you admit subsequently, the hatching may be protracted one month; but you say "eggs that would have hatched naturally the 1st of May will, if protracted to 1st of July, (that is two months,) become in their progeny diseased and perish sooner or later after being hatched."

Under my experiment, which you think goes to establish this position, eggs were hatched 28th April, and the worms did not become diseased; and another part of the eggs of the same identical stock and date, were hatched the 1st of August—that is, three months after; and yet the worms did not become diseased, and perish, but were equally free from disease, with the exception of about two dozen, from an accident—and they made good cocoons; how this can go to establish your doctrine—"that protraction beyond one month, will occasion disease and death," I cannot comprehend; you say, because the greater part of my papers of eggs in August did not hatch; but you will hold in mind that several thousands did hatch and prosper, were free from disease, and did *finish* their work; which fact is surely adverse to your doctrine, as much so, as if all had hatched; the cause of the *many* not hatching, may be fairly referred to their bad condition, when purchased; at that early date a few on some of the papers had already hatched—many had the different tints of color, indicative of advancement in different grades; and others retained their primitive gray, indicative of no advancement; this latter class, I

presume, were those which passed successfully through the ordeal of ice, and time, to August; the others having been previously advanced from the embryon, by causes unknown all perished. I have since understood, that it is not unusual, that a simultaneous deposite of eggs, on the same paper, and apparently under similar exposure, may exhibit the various grades of advancement; however mysterious and unintelligible, yet I believe the fact is unquestionable.

If my language has been obscure in the drafting of my report, as, from some of your notes, it seems to have been, I can only say, I much regret it.

I am, very respectfully, yours, &c.

JOSEPH E. MUSE.

POITOU ASSES.

From the Kentucky Farmer.

Maplewood, Oct. 30, 1840.

Dear Sir,—In the fall of 1835, I travelled in France from Paris to Bordeaux, and was much struck by the teams of large and heavy mules, which I saw as I advanced towards the latter place, drawing road wagons, laden with the wines and fruits of the south. Upon making some inquiry, I ascertained that they were begotten upon large Normandy or Brittany mares by a distinct race of asses peculiar to the old Province of Poitou, and not to be found any where else. The mules appeared to me of a description peculiarly suited for draught. Unlike those descended from Maltese asses, with which I was acquainted in Kentucky, they had large bones, heavy bodies and thick tails like horses. If the Maltese mules have more action and beauty, and are better calculated for the saddle and harness, these, it seemed to me, had more strength and constitution, and would probably suit better the plough and the dray. If the first would suit mountainous countries better, the latter might perhaps answer best in wet and low lands. At all events, I thought it worthy of an experiment to ascertain if Kentucky might not be benefited by the introduction of this new race. I was of opinion that possibly the cross with our part blooded mares would produce an animal well fitted for the work of drays and plantations, and that even our old breeds of asses might be benefited by an infusion of blood from this sturdy stock of France.

Acting upon these views, I selected a male and two females of the best that could be had, and had them shipped to New York. The male—a noble animal of the kind—and the lesser of the females died at sea, in a storm. The remaining jennet I have now in my possession. Not discouraged by this accident, my father (H. Clay) and myself sent an order to France for more, and received through the American consul at Havre, six animals of this stock—two males and four females.

We have had them now for several years, and though the experiment with them is not complete, it wears a promising aspect. Certain it is, that the French mule, bred as before stated, is larger than the mule of America, and to judge by appearance, much stronger and more capable of work. But it may be that its superiority in these respects is due in part to the dam. This will be tested in a short time, and if it turns out to be the case, it indicates the necessary of a double improvement, in the ass and in the farm mare.

It may interest some of your readers to know that the Normandy horse is somewhat above the medium size, generally of dull colors—frequently roan, heavy in the neck and crest, with a straight shoulder, good back, heavy quarters and wide across the hips. They are fine but not handsome horses, capable of much work, docile and not dainty in their habits, of sufficient courage and iron constitutions. They are fit for almost any work. They pull the French diligences at the rate of six or seven miles an hour, or a post-chaise much faster—frequently travelling in a short gallop. By officers who served in the Peninsular war, I was informed that they excelled for cavalry and artillery purposes—especially towards the winding up of a campaign—the sleek and beautiful horses which were sent from England.

My object in writing this note is to preserve in your valuable paper the memory of the importation mentioned above, as it may hereafter be interesting to the breeders of Kentucky.

With the best wishes for your success in the noble cause to which you have devoted your energies, I remain faithfully your friend,

HENRY CLAY, JR.

THE BENEFIT OF THE TREADING OF ANIMALS ON NEWLY SOWN WHEAT. THE "TRAMPLING ROLLER."

Many farms in lower Virginia have been greatly improved in fertility by the "inclosing system," that is, the prohibition of grazing, and giving the grass and weeds as manure to the land. But, on light soils especially, the crops of wheat have been thereby rendered very precarious, owing to the texture of the soil becoming too open and loose. Both wheat and clover thrive much better on soils of moderately compact and close texture, under equal circumstances of constitution, and of chemical combination of the ingredients of soils. By the total cessation of grazing, and relief from the treading of cattle, the ill effects to these two crops, and especially to wheat, will be experienced to a very injurious extent, on the best constituted soils. The remedy may appear obvious, and easy; and perhaps in many cases it is too easy to be applied; for by returning to grazing, though the faulty texture of the soil may be altered, the benefit is dearly paid for in renewing the old course of impoverishing the land. But in other cases, it is difficult to return to regular grazing, owing to the removal of the fences which before separated the different fields, and sometimes even the different farms.

As a substitute, more or less effective, for the treading of wheat land previous to its being ploughed up for sowing, or for the preparatory crop, an excellent practice would be to have the

field well trampled after sowing, and before the coming up of the plants. The benefits of this practice have been highly appreciated by some of the best farmers in Scotland; and, if beneficial on their previously grazed and stiff lands, and under their dripping climate, the practice would be far more so on our lands, of opposite condition in all these three respects. One among the great wheat farmers from whose answers to queries Sir John Sinclair digested his 'Husbandry of Scotland,' when speaking on this question, said that the freshly sown wheat land could not be too much trodden—and that he would be glad if a regiment of cavalry were to exercise their manœuvres on every acre of his field after its being sown. There is also stated in Rozier's '*Cours Complet d'Agriculture Française*,' a case of a newly sown wheat field being used to confine a flock of sheep, and which, by neglect, and by the sheep generally crowding at night towards the entrance, was trampled so much, that it was supposed that a part of the crop would be entirely lost. But, contrary to expectation, none of it suffered, and the part most trampled was the best. We quote from memory, not having read either of the passages referred to for many years, but believe that the main facts are correctly stated.

On a farm where the evil of a puffy soil, owing to the cessation of grazing, had been very sensibly felt, we advised the construction and use of a *trampling roller*, which, so far as we know, is entirely new. A round log of 5 feet length and 18 inches in diameter was bored full of holes, and large pins driven in, of 9 inches length clear of the log. These pins were two inches, or more, across their outer ends, or "tread," and these ends not more than 2 to 3 inches apart from each other in any direction. The outer ends of the pins were sawed off (where required) so as for their extremities to give a cylindrical surface, of 3 feet in diameter. The roller was set in a square frame to be drawn by; and when finished, seemed so heavy and unwieldy, that the negro driver (before hitching to) was sure that his team of four ordinary oxen could not draw it throughout the day. However, on trial, it proved to be a light draught, and much more so than the large square harrow used to cover the seed, and which sweeps about the same width.

The operation of this roller was altogether satisfactory, so far as can be judged in advance of results. Unluckily no strip of the piece of land so treated was left without the operation, for comparison of effects. Besides the trampling and consolidating the mould, generally, as was desired, the pins mashed every clod of any size, and much more effectually than is done by the usual mode of breaking clods by hand labor with the eyes of hoes. In the latter case, the large clods are merely broken into small ones; in the other, the more gradual but very heavy pressure of the roller not only breaks, but pulverizes the clods. And where much of this operation is needed, as on rough fallows, it may be well questioned whether the mere expense of breaking clods by hand labor, is not more costly than running a trampling roller.

The idea of this implement was furnished by that of the iron-spike roller, which is thinly set with sharp iron spikes, as this is, thickly, with blunt wooden pins. But the objects and operations of the two are very different. The spike roller is designed to reduce and make fine and loose the soil of very rough, cloddy, and soddy fallows, to prepare the land for tillage or for seed—whereas, the main design of the other is to consolidate the already too loose and open mould. The operation of the common roller is also very different, as that does not press sufficiently heavy on any places to serve much to consolidate, except merely at the surface; and by making the surface smooth and even, exposes the crops injuriously to the cold of winter. Smooth rolling hardens the surface, and thereby closes it against the influence of the air, and yet does not materially compact the soil below. The operation of the trampling roller is the reverse in both these respects.—Ed. F. R.

HARVESTING CARROTS.

From the Southern Cultivator.

Mr. Editor—If not too late, I will furnish you a few hints in regard to gathering and preserving this valuable crop through the winter. There are not many carrots grown in this state, and hence possibly the propriety of giving a few plain rules for taking care of them at this season.

It is an old opinion that carrots grow more in October than in any previous month. However that is, October is now gone, and carrots should be gathered. The first of November is a very good time for this operation. Before gathering, cut the tops about an inch above the crown with a sharp hoe. They are good food for cattle, and cows are fond of them. Then run a plough deep, drawn by a couple of horses, as close to the row as possible, when the carrots may be easily pulled and thrown into heaps or a cart. They will not stand as much cold as parsnips, but will keep very well in common dry cellars, covered over with a little straw or dry sand thrown freely among them. They may be kept perfectly well in open ground by selecting a high, dry spot, and digging a hole about one foot deep, four feet wide, and of any length you may wish, and laying the roots in, and piling them up three or four feet high, and covering them over six to twelve inches with straw. The advantage of raising the pile above the ground is to permit a slight circulation of air and

escape of heat which is apt to generate especially when the hill is first made. The covering of straw should first be made light, and then increased as the weather grows colder. The hole should be so made that water will not remain and settle on the bottom. B. S.

REMARKS ON THE SOILS AND MARLING OF THE PAMUNKEY LANDS. INTRODUCTORY TO THE QUERIES AND ANSWERS THEREON.

By the Editor.

The borders of the Pamunkey river are of peculiar and singular character. The flats extend generally from a mile to two, and sometimes even three miles in width, from the river, the highland or bluffs rarely, though sometimes, approaching on either side near to the water. The flats are divided, in common parlance, into the *low grounds* proper, and the *second low-grounds*, which rise to a much greater elevation than the former, and generally by an abrupt and marked transition. Though the low-grounds next the river are generally from 3 to 10 feet above high tide, a large portion is subject to be inundated by freshes, which sometimes, though rarely, rise many feet above the highest tide. This subjection to freshes, so uncommon on any of our tide-water rivers, is caused by the peculiar and remarkable narrowness of the Pamunkey, and its very crooked and meandering course. These natural causes, which cannot be avoided, are much increased by the artificial obstructions to the course of the water, formed by fish-weirs and traps, and fallen trees. If these were cleared away, and the trees on the margin removed, it is probable that the highest freshes would be reduced to several feet at least below the heights known and expected.

Though the greater part of the low-grounds and all of the second low-grounds are elevated far above any possible height of the water, in the present age, it is not the less manifest that the soil was originally deposited by alluvion. This great operation of nature, like similar effects on the lower James river, could only have been produced when both the height and volume of the water very far surpassed the present state of things. But it is proper to bear in mind this ancient formation by alluvion, as it serves to account for the peculiar characters of the soil, in respect to its uniform features and original fertility.

The soil of the Pamunkey low-grounds, both first and second, though formerly reduced almost every where to a low rate of product, was undoubtedly rich in its virgin state, but in a much less degree than the James river low-grounds, and others of the highest grade of original value. All verbal testimony is in support of this position. But still stronger evidence than such traditional accounts is presented, to my understanding, by the characteristics of the land, whether still continuing exhausted, or where recently again fertilized. All these lands are very light, from excess of sand; but all, so far as I was informed by report, were enough kind to clover, even before being marled, to justify the culture of that grass, where enough putrescent manures were applied; and gypsum, where tried, (on Chericoke,) was found to be beneficial to and profitable on clover. These two characteristics would be enough for me, any where in the tide-water region, to prove that such soil was *neutral*, and had been originally rich.

But though there is much uniformity in the general character of the Pamunkey low-lands, there is also much difference of quality and of value in minor points. Some of the land, as at Chericoke, was of chocolate-colored or mulatto soil; on other parts, and especially higher up the river, that peculiar mark of value was wanting, and the soil was inferior, though still of good original quality. In addition to the happy natural constitution of the Pamunkey soils in regard to fertility, and improvement by gypsum, and still more by putrescent manures, their lightness makes them easy to till, and easy to be relieved of superabundant moisture. The latter effect is also aided by the form of the surface, which is generally very slightly undulating, instead of being as level as its original formation might indicate.

But with all these advantages, there is one other which I would have supposed these soils (in common with other good neutral soils) would have wanted; that is, a capacity, such as the baser acid soils have, for being improved speedily, and in a high degree, by the application of marl. Such would have been my deduction, founded on experience of the operation of manures merely calcareous. But the marls which underlie these Pamunkey low-lands are universally mixed with green-sand; and from that compound a degree of effect and of profitable improvement has been derived, equal to that from pure calcareous marl on acid soils elsewhere.

I shall not here repeat the opinions and inferences in regard to green-sand which I have presented at several places in past volumes of the 'Farmers' Register;' nor will I, at this time, speculate, without light, on the hidden cause of the mysterious manuring operation of this earth; though my former views would be still more sustained by the facts which are elicited by the most recent observations. To this interesting and important subject I will hereafter recur, after having presented all the facts which will go either to confirm or overthrow theoretical views, and the fancies and vagaries of what are dignified by the name of scientific investigations of this subject. It will be merely necessary now to advert concisely to some of the general facts before observed, and also some of the grounds which I have heretofore maintained, and which even those of my readers who saw them when first presented could not be expected to remember now.

I do not pretend to know the cause, or how to explain the remarkable and mysterious operation, of green-sand as manure. In this respect, I readily confess my entire ignorance. Yet, my admitted ignorance is not greater than that of the geologists who have flourished so much on this subject, and have commanded respect for their crude opinions, by presuming on the greater ignorance, and greater modesty and deference to learned authority, of the agricultural community. The attributing the particular fertilizing effects of green-sand to the small contents of potash is as little supported by *reason*, as the assertion of the general operation of green-sand on all soils and all crops is by *facts*. Up to this time, and with the exception of the experience of Mr. Williams

Carter, heard of first only a few days ago, I have known of but a single fact in regard to the effects of green-sand *alone*, in Virginia, except in my own experiments. And on these three experimenters only will I still have to rely. Notwithstanding all the excitement produced in regard to green-sand, by the opinions expressed in the state geological reports of its great and general efficacy, and although these opinions have generally received much respect and credence, which they owed entirely to their *authority*, still, so far as I have been informed, there have yet been no other experiments made with green-sand *simply*, in Virginia, on soil not calcareous, except in the cases just referred to. It is probable that many other experiments may have been made; but, if so, I have heard nothing of the results or the trials.

But while confessing ignorance on this subject, it is neither my wish nor my habit to wrap myself up in prejudice, and repel light and instruction from any quarter, even though it may serve to show that my opinions are erroneous. Besides other less direct demands for the practical information which I was so anxious to obtain on this subject, more than three years ago, (at page 511 of Vol. V.,) I submitted particular queries in regard to the effects of green-sand, addressed to all who had used it. These produced not a single answer, and probably induced not one experiment. I still as earnestly desire information; and will be as ready to submit to such as will contradict my views, as to welcome any in confirmation. But until such disproof is furnished, I may be excused for trusting to my own practical experience, however contradictory it may be to closet speculations, and the one-sided facts of geological reports.

Therefore, until corrected by the more accurate and full observations and experience of others, I shall continue to hold these opinions in regard to green-sand as manure in lower Virginia:

That, whatever may be the source of power of this earth, (which I deem as yet altogether unexplained,) it is similar in action and effects to the equally mysterious manure, gypsum, or plaster of Paris.

That, like gypsum, if used in small or moderate quantities, green-sand is only operative (or at least profitable) on neutral and calcareous soils, and rarely even on these soils on any crop except clover, and other plants of that family.

That green-sand is *not* operative at all on acid or naturally poor soils, unless in unusual and excessive quantities; and then, or in any mode of application, that the manure is, like gypsum, but of temporary effect.

And that, on acid soils, where it is least operative, after the land being marled (or otherwise made calcareous) the green-sand, like gypsum, generally becomes operative on clover.

Although the facts are as yet much too few to establish all these positions, I will venture to predict that accurate experimenters and observers will, if trying proper experiments, find results in accordance with my views. Thus I infer that the pure green-sand earth (that is, containing no shells or calcareous matter) will have no profitable if indeed any effect, unless in enormous quantity, on any crop on acid soils; that it *will* generally have good effect on clover on the same soils after marling, or when constituting part of the marl applied, or on soils naturally calcareous or neutral; and that, even when most efficacious, if applied alone, or in such manner that its single operation can be estimated, the effect of green-sand will not be permanent, like calcareous manure, but temporary, like gypsum.

Now though I dissent altogether from the opinion that green-sand is, like a quack nostrum, a universal remedy for all diseases of land, and an improver of all soils and all crops, I value it more highly than some who have most profited by its use in conjunction with marl. Neither can it be alleged upon any plausible ground that I seek to disparage this manure, from prejudice or envy. Every prompting of vanity, as well as of self-interest, would induce precisely the contrary course; for I own extensive and rich beds of this earth, on the banks of James river; and, whatever may be the measure of the value of this earth, the discovery of its existence in Virginia, the earliest and most extensive trials of its effects, and the first idea and assertion of its identity with the famous green marl of New Jersey, all those merits, if they be such, were *mine*—as will be sufficiently evident to any inquirer who may refer to sundry pieces in the early volumes of the 'Farmers' Register,' on the New Jersey marl, and particularly to the earliest piece referring to it, my article "On the gypseous earth of James river," published in the first volume of the 'Farmers Register,' (p. 207,) which was extended from a shorter and much earlier communication to the old 'American Farmer,' and both of them referring to the discovery of the bed of earth made as early as 1817. It is very true, that being then, as now, ignorant of geological science and systems, I had never even heard of the term "green-sand," and of course did not use it; and moreover the action of the earth as manure was erroneously ascribed by me entirely to the gypsum which it sometimes contains, and not to the green-sand, of which I knew nothing. But the appearance and visible marks of the earth were so minutely and fully described, that it was impossible for any reader of the account, acquainted with green-sand elsewhere, to have mistaken the thing described, or to be doubtful of the similarity, if not identity, of the deposites.

This earth is found in great abundance along the banks of the Pamunkey, and, fortunately, is generally mixed with calcareous marl, to which intermixture the undoubtedly valuable effect of green-sand here is (as I infer) almost entirely owing. The beds of marl here are of the most ancient class of the tertiary marl (*eocene*) and in them the calcareous ingredient has, to greater or less extent, been removed, and substituted by green-sand. Over these beds of marl, as on James river, waters containing copperas (sulphate of iron) and alum (sulphate of alumine) are still oozing, and these salts are often perceptible both to the sight and taste. When meeting with shells or calcareous matter, both the former salts serve to decompose the carbonate of lime, and form, by new combination, sulphate of lime, or gypsum. Hence the removal of the shells, while their hollow forms yet remain perfect in the earth, and the total disappearance in many cases, (and this is generally so in the beds on James river,) of every trace of calcareous matter. And hence the appearance instead, of the more newly formed gypsum, in crystals, or in powder, as described in the article above referred to. But the gypsum has, in

the lapse of ages, been dissolved, and washed away either principally or entirely, and is only to be found in a few places, and in small proportion. The green-sand, in greater or smaller proportions, is found instead. Whence its origin, what was its formation, and even what its chemical constitution, I pretend not to understand. But even in the absence of all light on these points, the unlearned farmer may yet properly use, and profit by, this manure, and avoid falling into the gross and almost unmixed errors to which he would be led, if following merely the speculations and assertions thereon of geological reports, which speak of the manure in the most exalted terms, and offer none of the numerous and entire exceptions which oppose the opinion of its universal or even general efficacy.

The green-sand marl (that is, marl containing calcareous matter in large or considerable proportion, as well as green-sand,) is the only kind found under the Pamunkey low-grounds, and which has been thereon applied, for the 20 miles from Mr. Conrade Webb's farm in New Kent, to Edmund F. Wickham's in Hanover. The fertilizing effects have been very great—much more so, as they appeared to me, than *merely calcareous* marl could have produced so early on neutral soil —and I freely admit that a large share of the general benefit derived, must be due to the green-sand ingredient of the compound manure. Still, this opinion is held in subservience to the general propositions above stated as to its action; and therefore, I cannot but believe that the effect of the green-sand has lessened with time, or, in the oldest experiments, has even ceased, though no such effect has been observed or suspected, owing to the still *increasing* effect of the calcareous ingredient. However, as to this, let the reader judge for himself, from the answers which will be presented. These circumstances and effects are so peculiar, and so different in many respects from the action of merely calcareous marl, that I found myself on a new scene, in this green-sand marl region. The circumstances both of the Pamunkey soil and the marls are so different from those of the high and originally poor lands adjacent, that it will be proper to present the two classes under separate heads, instead of regarding either county or other artificial lines of division. The subject of the following answers will then be exclusively the Pamunkey low-grounds, and green-sand and calcareous marl, unless any partial exceptions to either should be particularly named.

Within a few days after returning from this interesting agricultural region, I visited Coggins farm, the scene of my own old marling labors, and was struck with the manifest inferiority of the growth of the young red clover which covers all the land from which wheat was reaped this year, to the clover of the same age on the green-sand marlings on the Pamunkey lands; and the comparison was made with parts of the land of Coggins farm where the greatest improvement had been made by marl, and where the last crop of corn was certainly equal in product to those lately on the highly improved Pamunkey lands, and, as I infer, to the last corn crops of the lands now bearing clover so much superior. This difference I cannot but ascribe to the action of the green-sand of the Pamunkey marl (not acting *alone*, but combined with and) superadded to the calcareous matter, which was exclusively (or *nearly so*) the active ingredient of the marl used in the cases referred to on Coggins farm. Although there are inexhaustible beds containing full 50 per cent. of green-sand, I had discontinued using that earth as manure, several years before having ceased to direct any farming operations; yet, under the impressions recently received, I would now advise the renewal of experiments, if not of general practice forthwith, and the commencement of trials wherever this earth can be used *on clover*, and on neutral or calcareous soils, or intermixed with, or after the application of calcareous marl. I would also advise smaller but sufficient experiments on other crops and other kinds of soils, to test the value of the opinions advanced above, as to the general inefficacy of this manure under such circumstances.

The ready answer to my denial of the *general efficacy* of green-sand as manure in lower Virginia, will be a reference to the extensive use and great benefits of this manure in New Jersey. As I know nothing *certain* of the particulars of these practices, either as to the precise nature of the manures, of the soils, the degree and permanency of effects, and especially of the *failures* (which are seldom if ever mentioned in published reports—) I will neither deny, nor receive as evidence, any thing that I have yet seen in regard to New Jersey marl and green-sand. I doubt not that great benefits have been there produced. But in the general ignorance of the cultivators, and the still more general confusion of terms as to the ingredients of the manures used, and the ignorance of geologists of agricultural science and truths, I suspend all expression of opinion, or particular inferences from the statements of New Jersey marling, until better informed as to the facts. My opinions of the effects of green-sand, as above and elsewhere expressed, are deduced from, and limited to, the operation as known by experiment in lower Virginia.

The agricultural community have been indebted to the writings (not of farmers, but) of geologists and scientific men, for the little truth and value, and the abundance of mystification, error, and false deductions, in regard to the action and effects to be expected of green-sand. The gain derived from these learned investigators would have been very far greater, and the errors much less, if they could have been content *not to know every thing* at the first glance; but, on the contrary, had submitted to confess their actual ignorance in many respects, and instead of deluding their confessedly unlearned disciples, the agriculturists, had asked the aid of *their* observations and experiments to dispel the great existing obscurity and difficulty of the subject. If geological surveyors were as much distinguished for the modesty and self-distrust which should belong to seekers of knowledge in a new field, and for patient labor of investigation in the pursuit, as they are for presumption, for the jumping to conclusions, and for scientific quackery, then their reports would have been a hundred-fold more profitable to the public—though possibly much less so to their individual interest and early reputation.

The operation of green-sand proper (or alone) is altogether a different matter from that of marl, and would not come under the queries designed to elicit statements of the effects of marl. But as these two manures, even when separate, are so

often confounded in common parlance and understanding, and as the substances also are intermixed in all the calcareous marls of the upper tide-waters of the Pamunkey, I shall add to the answers obtained on marling such accurate reports on the effects of green-sand alone as I may be able to obtain. Mr. Williams Carter's, at Broad Neck, in Hanover, is the only very considerable and continued practice known—and which is continued, as I fear, on the mistaken grounds of the supposed permanency of the early effects. The usual and unlucky connexion of the two properly distinct subjects, of green-sand and calcareous marl, and the erroneous deductions thence made, will serve as my excuse for the seeming digressive course of the preceding remarks, which were designed merely as prefatory to the answers on the Pamunkey marling.

The greater effect of the green sand marl on the clover (as seen in the first week of November,) over that of any merely calcareous marl, has been already stated. Another interesting evidence of the same is the stronger *fixing* of this grass, or making it as if natural to the soil. Dr. Braxton thinks (and acts upon the opinion) that after his marled land has been once well set in clover, the crops will continue to seed the land under his rotation, and that no subsequent sowing will ever be required. He finds, however, when clover seed is sown on this sandy soil, unless early in winter, that it is essential to its success to cover the seed by light harrowing—which he does regularly. My own former practice of sowing immediately *after* the passage of a harrow on wheat land, in the early part of spring, he thinks would not answer instead. He finds that the trampling of live stock is also necessary, to prevent the too great looseness and puffiness of the soil otherwise. He grazes one year in his rotation, (recently of five, and now about to be six fields,) on the clover to be fallowed the same autumn for wheat; not so closely however as not to leave a large remnant of the clover and other vegetable matter on the field.

Mr. Wm. F. Wickham's farm (South Wales) presents the oldest and most extensive, and therefore the most profitable marling practice on the Pamunkey. The great improvement made on his land generally, is the more remarkable, because he has long pursued the very severe four-shift rotation, of three grain crops in four years. But though Mr. Wickham has so long pursued this course, and has so much improved his land under it, (or notwithstanding its scourging character,) he objects much to its severity, and would prefer to add another field and another meliorating crop to his rotation. He has found, contrary to the established results as to our calcareous marls, that his marling is most improving on his originally good soils; and his limited experience of the green-sand marl on acid soil he thinks has not been very encouraging. Further, notwithstanding the happy mixture of calcareous matter and green-sand in all of his marl, he does not place so high an appreciation on the latter ingredient as he would on an equal addition to the former. He does not fear any injury to the land or crop from excess of quantity of his marl—and would not object to have a cover of six inches thick, but for the cost of applying. This opinion, alone, shows a remarkable difference of action between the merely calcareous and the green-sand marls. No where else did I hear of any injury produced by this green-sand marl, though no where else had there been applied such heavy dressings as Mr. Wickham's.

The transportation of marl by water is considered by most persons as so expensive an operation, that few farmers have yet undertaken it; and those who have engaged a supply from lightermen, have been made to pay exorbitantly, and often for a commodity of very suspicous character, if not certainly of bad quality. This much dreaded operation is shown by Dr. Braxton's practice to be a mere trifle, at least on the sheltered and calm navigation of the Pamunkey. Dr. Braxton has both the green-sand upper stratum (as general throughout) and the green-sand marl beneath, on his own land; but as the latter, which only he values or cares to use, dips there below the level of the tide, he prefers to dig similar marl eight miles higher up the river, and bring it by a lighter to his landing. At my request he furnished a statement and estimate of the cost of this labor, which will be annexed, and which I hope will be valuable both as instruction and inducement to many farmers who cannot be supplied with marl, except by water-carriage.

The answers and remarks of Mr. William F. Wickham, which will stand first, as in the order of priority of practice and experience, were not received until after the foregoing introductory observations were written, and in type. This will account for some passages which may now appear superfluous; and, also, for the omitting to refer to other subjects mentioned by Mr. Wickham. It is proper also to state that, in consequence of delay or miscarriage of the specimens selected for me, the marls of Dr. Braxton and of Mr. Carter Braxton were not received and analyzed until after the foregoing general remarks thereon were in type.

In the following statements of the constituent parts of marls, given in the notes to the answers, the propertion of carbonate of lime (or pure calcareous earth) was ascertained very exactly by means of Davy's pneumatic apparatus. The proportions of the remainder, of sand and of clay, (or finely divided earth,) when mentioned separately, were separated by agitation in water and difference of specific gravity; and of course this mechanical mode of separation is not very exact. The green-sand (said to be a chemical compound of silex, iron, and a little pot-ash,) being insoluble in, and not affected by the muriatic acid, and being in grains, and of very nearly of equal specific gravity with silicious sand, it remains with the latter; and the proportion of green-sand was then *guessed*, by carefully observing the mixture of the two through a magnifying glass. This mode of determining proportions, *by sight and by guess*, is altogether too rough and inaccurate to be relied on for exactness, and therefore it is proper thus to explain the mode of examination, and to confess its faultiness. However, as the grains of green-sand are black and opaque, (when seen in grains) and the silicious sand is white and crystalline, the distinction and contrast are so marked, that it is not difficult to approach to something like the relative proportions even by the eye.

As thus examined, the contents of green-sand, in every case, fell below previous reputation; and the calcareous matter in a still more remarkable

degree, in the green-sand marls used by Dr. Braxton and Mr. Carter Braxton. And the less the strength of the marl in calcareous matter, the more remarkable are the effects produced and reported; and the more important and valuable the use, and the more is required full and proper investigation of the qualities, and accurate experiments of the operation and effects of the other ingredient—the mysterious substance, green-sand, of which it may be truly said that all that we yet know is, that we know nothing. In regard to the most interesting and important of these marls, (on account of its extensive application,) that from G. W. Bassett's land, used by Dr. Braxton, the calcareous ingredient is so small (only 11 per cent.) that I think the specimen sent to me could not have presented any thing like a fair average of quality, as it certainly was selected for. But all that the operator can do, by analyzing, is to ascertain accurately the amount of carbonate of lime in the particular specimen presented to him; and therefore as much depends upon the care and judgment used in selecting specimens, and the mode of taking them, and their amount, as afterwards upon analyzing them, to enable the operator to state truly the average strength of any layer or body of marl. It was Dr. Braxton's opinion that this marl contained three times as much calcareous matter, as this specimen produced. The whole mass, after being dug, and mixed by loading and unloading the vessel, as I saw the marl at Chericoke, is very uniform in appearance, and the shelly matter is generally so finely divided as not to be distinguished by the eye.

QUERIES (REPEATED FROM PAGE 489) TO ASCERTAIN THE ACTION AND EFFECTS OF SHELL MARL AS MANURE, IN GENERAL, AND ANSWERS AS TO THE GREEN-SAND MARL USED ON THE PAMUNKEY RIVER LANDS.

1. When was the use of marl as manure commenced on your farm?
2. Whose property was the farm, and under whose direction was its general management, (if not your own,) then, and since?
3. What was the quantity of cleared land on the farm then ready for and subjected in its turn to cultivation of any kind, exclusive of all waste ground?
4. What is the quantity since added, by new clearings of wood-land, or other waste spots brought into tillage? And, generally, was the land thus added richer or poorer than the present average quality of the farm?
5. What was the rate of progress in extending the marling—and, altogether, how many acres have been now marled?
6. What was the usual strength of the marl used, or its proportion per cent. of carbonate of lime, or pure shelly matter?
7. Was there any peculiar quality or ingredient, besides the carbonate of lime, that served to give additional value to the manure—as "green sand," or gypsum, or a large proportion of fine clay, &c.?
8. Or was there any thing that served more than usually to lessen the value, as stony hardness of many shells, or of masses of marl, &c.?
9. What have been the usual quantities of marl applied to the acre?
10. Have there been made trials of any *much lighter dressings* of marl than the usual quantities—and if so, what were the results, compared to the usual quantities?
11. Have there been made trials of any *much heavier dressings* than the usual quantities—and with what comparative results?
12. Was the cropping and general management of the land, *for a few years immediately previous to its being marled*, such as might be considered *meliorating* or *improving*, (or at least as *preserving* its degree of fertility,) or was it *impoverishing*, and wasting of fertility in general? State the rotation of crops, if known.
13. The same question as to the few years immediately after marling, and since.
14. What have been the usual and general results of the applications of marl, on the increase of the crop next following, on land in different conditions—and afterwards to the present time?
15. Have the earliest fertilizing effects of marl (or the increased product of the first crop, or first course of crops in the rotation,) been subsequently increased or diminished by lapse of time—and in either case, under, and in proportion to, what circumstances?
16. Is it your opinion, whether founded on experience or observation, that the early increased product of your marled land (say for the first three or four crops, or of any number you have yet made thereon,) will be subsequently diminished, under any rotation of crops, or course of cultivation, that would not have been decidedly exhausting and injurious to the land, if marl had not been applied?
17. Has sterility, or other damage, been caused on any part of the land, by applying marl too heavily, or in any other manner—and under what circumstances of soil, tillage, &c.?
18. Has it been found that any other manures, either vegetable and putrescent, or mineral, are more efficacious, or durable, on poor natural soils *after* marling them?
19. What do you suppose was the average productive power, in corn, per acre, of all your now arable and cultivated land, before marling?
20. What do you suppose is the present average productive power of the same in corn?
21. What was the usual or average quantity of the crops of wheat made annually on the farm before marling, and recently?
22. Taking such general grounds for the estimate as may be satisfactory to your own judgment, state what you suppose to be the annual value of the present *general* or *average gross product* of grain, or other marketable products of the fields in cultivation, of the land marled, caused by, and owing to marling—per acre, and also in total amount annually from the whole farm?
23. Does your experience or observation serve to contradict any of the important theoretical opi-

nions in regard to the action of marl, or statements of actual results in practice, as presented in the "recapitulation" embraced in pages 53 to 56 of 'Essay on Calcareous Manures'—and if so contradicting, in what particulars?

I. *Answers to the queries on the use of marl by William F. Wickham, of Hanover county, in regard to his South Wales farm.*

Answer to 1*st query.*—The use of marl was commenced on my plantation in 1820.

2*d.*—It was my property, under the general management of an overseer, subject to such orders as I gave on occasional visits till 1827—from which time I have been residing on it.

3*d.*—There were, when I began to marl, about 600 acres cleared on the plantation. I have since added by purchase 400 of open land, making in all 1000 acres, consisting of Pamunkey low-grounds and second low-grounds or table land in cultivation.

4*th.*—I have cleared some 15 or 20 acres of the same description, but inferior originally to the rest of the plantation.

5*th.*—The annual progress in marling has been irregular. Less was done by my overseer than has been done by myself since my residence here. I have now marled upwards of 900 acres.

6*th.*—The proportion of carbonate of lime in my marl I estimate at 45 per centum—a rough analysis gave about that amount.*

7*th.*—It contains green-sand, but in what proportion I have no means of ascertaining. Some beds appear to abound more in it than others, and different parts of the same bed to have it in unequal quantities. There is also an efflorescence on the marl, and on the superincumbent green-sand, that has a bitter astringent taste resembling that of alum. I do not know there is any gypsum in it.*

8*th.*—We find masses of shells and earth conglomerated and as hard as stone, but too few to affect the value of the marl; they are never carried into the field except by accident.

9*th.*—The quantity of marl I have used to the acre has been from 600 to 1200 bushels, generally about 800, and often at the rate of 2000 or 3000.

10*th.*—I do not think I have ever used less than five or six hundred bushels to the acre.

11*th.*—When I have put 2000 or 3000 bushels on the acre it has been on land that was highly manured, and I never perceived the least injury from an excess of marl. The land to which these large quantities were applied has continued in the greatest state of productiveness. Perhaps a smaller quantity might have proved equally beneficial for a time; but as a permanent improvement, where the land was originally good, or other manures can be used with the marl, I prefer as much as I can carry on the land.

12*th.*—Before I commenced marling the plantation was cultivated on the old three-field system—corn, wheat, pasture; no clover, and but little manure made. It was generally in a state of extreme sterility.

13*th.*—The improvement from marl was apparent in a year or two, and has been regularly progressive.

14*th.*—Its effect on the first succeeding crop was slight, except on cotton, where it acted immediately and with great benefit. It was generally spread on land intended to be sown in wheat or planted in corn. On the wheat that followed corn, clover was in every instance sown, and the first decided advantage was to the clover crop. The stronger the land the more apparent was that benefit.

15*th and* 16*th.*—The earliest fertilizing effects produced by marl, and the addition to the crops arising from its use, have been constantly augmenting in a rapidly increasing ratio, so that every year adds to my opinion of its value; so far am I from apprehending the increased product is likely to be diminished, that, on the contrary, from an experience of twenty years, I am satisfied, with my imperfect husbandry, the land on which it was first used (as well as all the rest to which it has been applied) has been constantly improving, and will continue to do so.

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* Three specimens of Mr. Wickham's marl, selected from bodies which he had mostly used from, and which he supposed presented fair averages of value, were afterwards analyzed, and found to contain the following proportions:

No. 1. Shell marl, blackish when moist, from upper part of bed, in Barn field, back from the river, consisted of carbonate of lime - -	32.50
Silicious sand and green-sand together (the green-sand judged by the eye to be about two-fifths of this residuum, or 22 grains,)	56
Dark gray clay, and loss - - -	11.50
	100
No. 2. Blackish shell marl (like the preceding) from the lower part of bed near river bank, consisted of carbonate of lime -	44
Silicious sand and green-sand (of which the latter appeared to be about one-fifth of this part, or 8 grains,) - - -	39
Dark gray clay and loss - - -	17
	100
No. 3. Light colored, (yellowish or reddish,) shell marl forming the stratum above the preceding (No. 2.) consisted of carbonate of lime - - - - -	36
Silicious sand and green-sand, (of which the latter appeared to be one-tenth of this part, or) - - - - -	47
Yellow clay and loss - - -	17
	100

* Both alum and copperas, (sulphate of alumine and sulphate of iron,) intermixed, are so abundant in some of the over-lying earth, that a thin crust of these salts is to be seen on the outside, left by the drying of the slowly oozing waters. The taste gave sufficient evidence of the kind of these salts, as the sight did of their existence and source. And as the contact of either of these salts with shells could not fail to form sulphate of lime, (gypsum, or plaster of Paris,) it is equally certain that some of the latter substance must be in those parts of the marl, until dissolved and carried off, though there is no appearance of it to the eye that could be relied on.—E. R.

There can be no doubt there is no manure more permanent; but for the use of marl, I am convinced my land, under my severe cropping, would have been reduced to a lower condition, if possible, than it was in when I began its use.

17*th*.—Upon a few acres, not more than five or six, of sandy gravelly hill-side, I have seen the corn I think injured by marl. The stalks in the spring grew larger than before, but they fired early, and in many cases produced no ears. The land was unimproveable, and not worth the cultivation. It looks rather better than formerly, and produces meager crops of corn and oats, but does not pay for the labor, which, however, is trivial, that is bestowed on it. I do not remember that I have sown clover on this piece of land—here I suppose 800 bushels of marl were used to the acre. On no other spot do I perceive that damage has been done by too much marl.

18*th*.—The effect of putrescent manures has been very much increased by the marl. I do not know that the first crop has been much better; but the improvement from their use has thus been rendered permanent. My practice is never to permit these manures to be turned in without accompanying them with a heavy dressing of marl. Plaster of Paris acts on clover, when the land has been marled, with wonderful efficacy. The result of an experiment I made will be found in the 4th Vol. of the 'Farmers' Register,' p. 579. My subsequent experience confirms that experiment.

19*th and* 20*th*.—The average crops of corn per acre before I began the use of marl did not exceed three or four barrels—they are now from six to eight.

21*st*.—The wheat crop has varied so much, even on the very best lands in this part of Virginia, depending, as it would seem, much more on the season than on the cultivation or soil, that it is difficult to state an average; but I think the increase has been in an equal ratio with the corn crop.

22*d*.—The increased product of my land from the use of marl, aided by a somewhat improved agriculture, I estimate at from 50 to 100 per centum. The effect of the marl has been increased by the application of large quantities of manure from every source from which it could be derived.

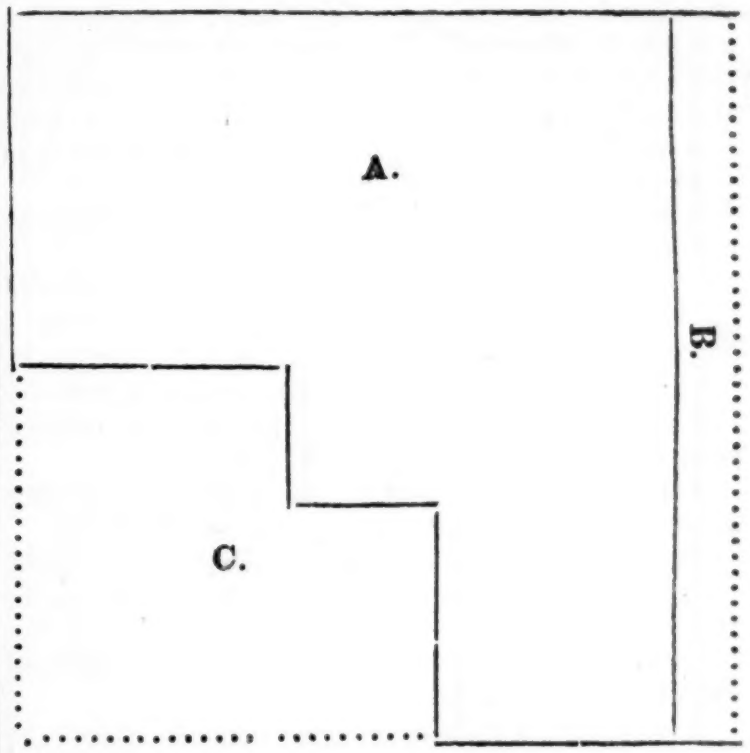
23*d*.—My experience in no manner conflicts with any thing I remember in your 'Essay on Calcareous Manures.' Sorrel I have seen growing even on piles of marl; but after it has been incorporated with the soil the sorrel certainly disappears. I will not undertake to say whether this is owing to the chemical action of the marl on the land or to its promoting the growth of other plants, clover for instance, that eradicate the sorrel; but the result is as I have stated it. I have attended rather to facts than to theory, not giving myself much concern about the *modus operandi*. If my observations are in any manner inconsistent with your views, you will find them mentioned in this communication; but I am not apprised there is any discrepancy.

Here permit me to bear testimony to the accuracy and the great value of your 'Essay.' It has been of incalculable benefit to all the calcareous region of lower Virginia, (to which however it is by no means confined,) and the effects of your zeal must continue for generations. I know of no treatise on any branch of agriculture so valuable and so complete.

In the use of marl, I have directed my attention but little to minute experiments, being satisfied with general results. The whole character of the soil, and of the estate on which I have used it, has been changed, and no passing observer can fail to be struck with the difference of the land to which it has been applied, and the surrounding country where it has not been used. In the progress of the operation the limits of the marled land have generally been defined with the greatest precision; so that the transition from barrenness to fertility has been marked as if a line had been drawn.

I said the marl with apparently the greatest proportion of green-sand had proved the most efficacious. The following is an extract from a memorandum made at the date it bears. The land to which it relates, about fifteen acres, was much exhausted, and is at this time in the highest state of improvement. Here and there, on the weaker spots, a small quantity of putrescent manure has been used, but not to the extent of one-tenth part of the whole. Clover has always been sown on it at that stage of my rotation that permitted it. The land is slightly undulating.

Extract.—"1830, *May* 10*th*.—The most remarkable effect I have ever seen from manure, [*meaning marl,*] is on the clover crop, in the river field at the Lane. It was marled in the summer of 1828, then fallowed and sown in wheat—and clover was sown on it in the spring of 1829. The marl shows its effect in this manner—



"A. Marled throughout, well taken in clover, and a heavy crop in the bottoms.

"B. Half a bed not marled and scarcely any clover.

"C. Not marled and very little clover, though as much seed was sown on B and C as on A. The difference between the marled land and that not marled, can now be distinguished to a line as far as the field can be distinctly seen. The upper end of the field (not included in the above experiment,) was manured from the farm-yard. It

produced better wheat than the marled land, but is far behind it in clover."

The lines, above represented, have been many years obliterated, the whole field having been marled, and it is now in a state of uniform fertility.

I am in favor of using large quantities of marl, especially if the land be in good heart, or other manure can be applied with it. Yet, in many instances I have perceived no difference between the effects of 600 bushels to the acre and three times as much. The most fertile soils (in Europe) are represented as containing 20 per cent. of calcareous matter—and, considering marl as acting almost entirely by virtue of the lime it contains, it would take ten thousand bushels of my marl to give 20 per cent. of carbonate of lime to a soil ploughed seven inches deep. I therefore have no fear of using too much marl. The following experiment justifies this opinion. Some years ago, I carted a large quantity of marl into a pile near an old barn, intending to mix it with the rubbish and scrapings around, and then to spread it on some of the contiguous land. Before I had done so, it occurred to me to permit a part of the pile for 2 or 3 yards square to remain undisturbed and to plough it with the rest of the land. Nothing was put with the marl; but some dirt without doubt was mixed with it in the operation of ploughing. The depth of the heap was from 8 to 12 inches. It was planted with corn and cultivated with the surrounding land. The whole piece produced a very heavy crop, and the corn on the pile of marl was equal to the rest. I perceived no difference in the wheat that followed. It is now covered with clover and weeds, and on their being removed, has at this moment the appearance of a heap of marl with a slight mixture of dark earth. Anderson, in his essay on lime, speaks of a similar experiment. In a part of his field a large quantity of lime from some accident was suffered to remain in a heap, not spread, but mixed with the soil by cultivation, and the improvement was very great.

The marl I use probably contains some remains of the animal matter besides the shells.

There are frequently several feet of green-sand earth, without shells, above the marl. This I have uniformly thrown aside without using it. The green-sand mixed with the shells is exactly like that lying above them. I have never applied that which is without the shells.

I will mention a few of the general rules that have governed me in the application of marl:

Never to use less than 600 bushels to the acre.

Not to expect much benefit from it till clover has been sown.

To sow clover seed invariably on marled land when the rotation permits it.

If the land is strong, or well taken in clover, or putrescent manures can be used at the same time, never to fear putting too much marl on the land.

To carry marl on manured land before it is put in a crop; in other words, never to use other manure without marl.

To sow plaster of Paris on clover on marled land.

To cut but little clover, and that on the richer spots—not to graze too close, and to turn under as much clover as I can.

To have, whenever it can be done, vegetable matter ploughed in with the marl. To these rules I endeavor to adhere.

Much less marl than I have used, would for a time perhaps be equally efficacious. My beds are generally so convenient to the fields that I have carried out larger quantities than I should otherwise have done.

A small spot—about an acre of land in broom straw that had been turned out, as I supposed, from exhaustion, I once marled, and it has since produced excellent crops—about 8 barrels of corn to the acre. Perhaps it was in better heart than it appeared to be.

The 15 or 20 acres of land I mentioned as being cleared by me have been constantly improving.

I have given a heavy dressing of marl a second time to land that had been much improved by a previous marling, with great benefit.

Of the effect of green-sand alone, I have no experience of my own.

Near two years ago, I was in New Jersey, and saw at a depot, on the canal near Princeton, green-sand, there called marl, that had been brought from the interior of the state and up the Delaware a distance of some forty miles, was sold at the depot at 12 cts. the bushel, and then carted as I witnessed more than two miles, and I was informed much further. It contained no shells and resembled exactly our green-sand, so much so that a parcel I brought home got blended with parcels from my own bank and from a neighbor's, and I could never distinguish which was from New Jersey. A high value must have been placed on it from the price it cost and the distance it was carried. I was not long enough there to learn any thing of the manner of using it, or the quantity put on an acre.

My marl I have tried on poor sandy forest land, (not included in the above account) but without manure and clover, and without mixing it with the soil by cultivation, only a crop of oats having been taken from the land. It is long since the land has been disturbed [by the plough]; but it does not appear to have improved to any extent. The great impediment to the improvement of my land is the execrable rotation I pursue—three grain crops in four years. I hope to correct it, but must first have more arable land. Many of the experiments I have detailed would lead to various speculations, but I will not pursue them. No one has more reason to be satisfied of the immense advantage resulting from the use of marl than myself. I have avoided all exaggeration, and have rather underrated its importance.

Several of my neighbors have used marl with much advantage. I will name Mr. James T. Sutton, Dr. Wm. R. Nelson, Mr. Jos. Spotswood Winfield, Mr. Goddin and Mr. Campbell. These gentlemen I have no doubt could communicate valuable facts to you. Mr. Edmund Winston, a very skilful and successful farmer, hauls marl eight miles to spread on his land.

This desultory communication made at your request I feel satisfied presents no new views. I do not hope to add to the information that you have given to the public, but being conscious of the great obligations that I, with every one engaged in the same pursuit, am under to you, I could not disregard the wishes you were so kind as to express. This is my only apology for occupying so much of your 'Register.'

Nov. 19*th*, 1840.

II. *Answers by Dr. Corbin Braxton, of Chericoke, King William county.*

Answer to 1*st query.*—The use of marl at Chericoke, the farm on which I reside, and to which these answers will be confined, was commenced in 1834.

2*d.*—The farm was my own then, and since.

3*d.*—The quantity of cleared and cultivated land then about 500 acres.

4*th.*—About 50 acres since added, generally of waste spots, and poorer than the other. In all now 550 acres.

5*th.*—About 50 to 70 acres marled annually, and about 400 acres now covered. All the marl brought eight miles by water, on a camel lighter, from the lands of Geo. W. Bassett, above. My own marl dips so much as to be lower than the level of the water of the river.*

6*th.*—According to Professor Rogers' analysis and report, this marl has 34 per cent. of calcareous matter. The marl is friable, and the calcareous matter finely divided.†

7*th.*—This marl also contains, according to Professor Rogers, 34 per cent. of green-sand.

8*th.*—Nothing contained in the marl to lessen the value.

9*th.*—The usual quantities applied from 200 to 300 bushels per acre.

10*th.*—As little as 100 bushels to the acre I have applied with benefit; but not so great as the larger quantities.

11*th.*—I have never, that I am aware of, exceeded 300 bushels to the acre. The result was better than a lesser quantity, but this superiority was evidenced more on grasses than on grain. Wherever enough *green-sand-marl* (mark the expression‡) has been put, the weeds, after the first year of the growth, are eradicated, and if there is not enough red clover seed in the ground to occupy the land, the surface is covered by white clover, without any seed having been sown.

12*th.*—The previous cropping was meliorating, so far as some red clover, an abundant crop of weeds left to die on the land, and what other putrescent manure we could prepare on the farm, could make it. The five-field rotation had been pursued for two or three years before I commenced marling, (1. corn, 2. wheat or oats, 3. clover, fallowed, 4. wheat, 5. pasture not closely grazed.) Before that the common three-field rotation had obtained.

13*th.*—The same five-field rotation has been continued since marling, but is about to be changed to six-fields, by the introducing of a pea-crop. The partial grazing, in the year preceding corn, is deemed more beneficial than injurious to the subsequent product, as the light soil needs the treading of stock.

14*th.*—The corn crop on the poorer land, next succeeding the marling, I think has been increased from 100 to 200 per cent. On the better land about 100 per cent. The land, judging from its appearance and the crops raised, has continued to improve afterwards; but with my rotation and the short time I have been at it, I have not had an opportunity of observing many second crops of corn after the marling, and the Hessian fly invariably destroys my corn-field wheat.

15*th.*—My experience (on the farm on which I live) with marl has been too limited to answer this query satisfactorily; but as far as I can judge, the early effects have certainly been greatly increased afterwards.

16*th.*—I have no expectation of any future diminution of the rate of product already derived, under the circumstances by me stated, or supposed in the query.

17*th.*—Being anxious to get over the whole surface of the farm as early as possible, I have never marled as heavily as the land could bear of green-sand marl, perhaps by two-thirds, or three-fourths—and, therefore, I have no damaged or marl-burnt spots. But our county presents much of such effects; which are generally found on gravelly knolls, whether of light or stiff soil, and where most devoid of vegetable matter. But this damaged land, so far as I have seen, is all easily reclaimed, and made rich, by a free application of vegetable matter, or other putrescent manure—but the animalized manures acting decidedly better than the purely vegetable.

18*th.*—All vegetable manures have acted better since marling than before, and, as far as I can judge, are durable, and the land looks rich after their use; whereas, before marling, on the light soils, the effect of the putrescent manuring generally passed off with the first crop. Before marling, gypsum had good effect on clover, and also on turnips. But after using the green-sand marl, gypsum had no preceptible effect, as it seemed to be surpassed in effect, and superseded by the green-sand ingredient.

19*th.*—Before marling, my fields averaged from 15 to 20 bushels of corn per acre.

20*th.*—My corn crop for the last three years averaged 40 bushels, being all on marled land. This year is included, supposing that it will certainly produce at least as much as the two former.

21*st.*—My crops of wheat have more than doubled since I have been fallowing, but I have not as yet had a fair opportunity of judging the effects on marled land fallowed, as my fields are just now coming in rotation, this being the first year of fallowing proper after marling. As before stated I cannot make wheat after corn, on rich or poor, marled or unmarled land.

22*d.*—If the price of corn be put at $2.75 the barrel and wheat at $1.20 the bushel, I suppose the increase of grain, from marling, to be worth

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* An estimate of the expense of the digging, transportation, &c. of this marl, was prepared at our request, and will be inserted in a subsequent part of this number.—Ed.

† The only specimen furnished contained:

Carbonate of lime - - -	11 grs.
Sand, coarse, - - - -	82
Of which about one-third, or 27 grains was of green-sand.	
Dark gray clay, (or finely divided earth,) and loss - - - -	7
	100

See remarks on this specimen, p. 683. E. R.

‡ Meaning a calcareous marl, containing also green-sand.—Ed.

$8.60 for each acre under grain crops, and nearly $2600 on the farm each year, for grain alone. Parts of several fields (amounting as above stated to about 150 acres) are yet to be marled, and of course have added nothing to this product. My gross products, as well as the net, are very much better than they formerly were under the three-shift rotation, although I now cultivate but one-sixth of the surface, whereas formerly it was one-third.

23*d*.—As far as my observation and experience have gone, I have seen nothing to contradict, but on the contrary every thing to confirm the theoretical views advanced by you respecting the action of marl, in the 'Essay on Calcareous Manures.'

November 4*th*, 1840.

III. *Answers of Carter Braxton, in regard to Newcastle farm, Hanover.*

Answers to 1*st query*.—The first marling was done in 1832, or '33. But this is conjecture.

2*d*.—When marl was first used on the farm I own, it was the property of Mrs. E. Ruffin, from whom I purchased in 1837; it was under her management before then, and my own since.

3*d and* 4*th*.—The cleared land was then about 750 acres; and none of any consequence has been added since.

5*th*.—In 1837, when I took possession of the estate, I found about 120 acres marled. Since then, I have marled about 230—making in all 350 acres.

6*th*.—I am wholly unacquainted with the proportions of component parts of the marl.

7*th and* 8*th*.—The upper stratum of our marl banks, for 3 to 5 feet in thickness, appear to be very full of shells, and some masses of them are very hard. Below that, for any known depth, as none of them has been yet penetrated to the bottom, there is a good deal of shell, some entire and the rest in fragments, mixed with the marl. The color of our marl in the bank is bluish; but that below the top stratum, soon after coming from the pit, has a greenish complexion, when looked at against the sun; and all of it is supposed to contain a large proportion of green-sand. The immediate effect of this marl is equal to what could be expected of any marl.*

9*th*, 10*th and* 11*th*.—From 250 to 300 bushels usually applied. A portion of my present corn field received only 175 bushels to the acre, a third less than the usual quantity—the soil on which this smallest portion was put, in appearance was no better, if as good as that on which more marl was placed; but the crop of corn now looks equally good, if not superior, to that with the largest portion. No experiment with a larger portion than 300 bushels.

12*th*.—It may be said that the cultivation was meliorating. The farm was in four fields—the number of stock small—and the land kept under the inclosing system; but the land generally produced nothing else than weeds; in some spots, bird-foot clover—the second year after cultivation the land put up in stick-weed, which overcame every other grass and weed. In my opinion, this is a system that adds nothing to our lands.

13*th*.—Since marling I have kept the land in four fields—have grazed much more heavily than my predecessor; but have sown clover on all the marled land, which has always flourished luxuriantly.

14*th*.—The effect has been an increase of from 50 to 100 per cent., according to the condition of the land before marling. I have cultivated no land, that I have marled, but once; I have this year cultivated 40 acres in corn, that was about the first marled land on the farm; it was not represented to me as being extraordinary for fertility when I purchased, and I think the crop is now at least equal to 8 barrels: this land I clovered, the year I purchased. I have no doubt, from my best observation, that the improvement of the marled soil is progressive every year: but I am fully convinced, that the improvement is greatly augmented by the use of clover, which gives additional fertility to the soil every day it remains on the ground. A farmer that neglects to clover, derives only half of the benefit he otherwise would from marling. It has been said "without clover, no manure—without manure, no corn, wheat," &c.; we may say here, "without marl, no clover, and without clover, no corn, wheat, &c."

15*th*.—The earliest effects have increased; from but one experiment, I speak, however—and from all the observation I can bestow, that will be the invariable result.

16*th*.—I have never witnessed any diminution of the early product—and from all that I can conjecture, none can be apprehended in all future time.

17*th*.—I know of no injurious result of marling, in any instance on my own land.

18*th*.—I have never used any other mineral manure. I think I may positively assert, from my limited experience, that putrescent manure is more durable after marling. I am not determined whether it is more efficacious on the first crop.

19*th*.—The product before marling, on an average, was hardly fifteen bushels of corn per acre.

20*th*.—The present productive power of the same

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* The specimen of upper stratum contained:

Carbonate of lime - - -	36 grs.
Sand, part coarse, principally fine, -	36
Of which about one-fourth, or 9 grains, was green-sand.	
Gray clay, (or finely divided earth,) and loss - - - - -	28
	100

The specimen of lower stratum, containing but few and small fragments of shells, consisted of

Carbonate of lime - - -	2
Sand, fine - - - -	76
Of which about one-tenth, or 7½ grains was green-sand.	
Gray clay, (or finely divided earth,) and loss - - - - -	22
	100

Average of the upper and lower stratum, if equal depths are used:

Carbonate of lime in 100 grains - -	18½ grs.
Green-sand do. - -	8¼

E. R.

land I suppose to be fully thirty bushels of corn per acre.

21*st*.—The ravages of the fly have been such, for the two last years, that no data can be obtained from the crops of wheat of those years. In 1838 I reaped at least 14 bushels to the acre after corn; that crop was seeded entirely on marled land. I marled and manured a lot of 9 acres in 1839, and planted it in corn, the product was 84 barrels—the corn measured in June, the year after it was made. The same lot was seeded last fall in wheat, and although it seemed to be destroyed in the spring by fly, yet it yielded 102 bushels of wheat that weighed 61 lbs.

22*d*.—The increased product of corn is worth fully $9 per acre—$2,000 corn crop alone. The wheat, as has been observed, having been too unproductive to furnish any data for an estimate.

23*d*.—I know of nothing to contradict the "recapitulation" in the 'Essay on Calcareous Manures;' but every known result corroborates the deductions of that work, which gave birth to a revolution in the agriculture of our country, that will be ever memorable in its annals—and place its author among its greatest benefactors.

November 5th, 1840.

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IV. *Answers of Williams Carter, in regard to the applications and effects of green-sand alone, on his Broad Neck farm, Hanover county.*

Broad Neck, Hanover Co.,
Nov. 23d, 1840.

In answer to your queries upon the subject of green-sand, I have it in my power to state, with considerable accuracy, the results of experiments made with that manure.* Four years ago, in the spring of 1836, before planting, I carted upon a belt of land, running diagonally through the field designed for corn, green-sand, to the amount of about 1000 bushels to the acre. The belt, 10 feet wide, was run in a diagonal direction, so as to embrace three distinct varieties of soil, in order that I might ascertain which it would most benefit. At one end of the belt, the land is a coarse, yellow sand, poor, and fit only for corn, and producing that in but small quantities. In the middle, the soil is good, producing corn, wheat and clover very well. The other extreme runs gradually into a "livery," white, cold soil, producing, tolerably well only, our usual crops; much inferior to the middle, but better than the first portion. The green-sand was spread evenly over the surface of the belt, which had been marked off distinctly with a plough—the corn planted over the whole field, and all treated alike. I plough but one way, drilling the corn. I also put green-sand into a few hundred hills of corn in another part of the field, and some time after, in planting cotton, gave a good allowance to alternate rows. During the whole of the summer of 1836, I watched the growth of the corn and cotton in hills, drills, and belt, but found no difference between that which had, and that which had not the green-sand. In October, the field was sown in wheat. The spring of '37 came, but along with it no improvement in the wheat; on the contrary, it was decidedly injured—killed out; and the ground wore the appearance of being under the influence of frost, even as late as the month of April—looking spongy, spewed up. From this time, I thought no more of green-sand, till my return from the Springs, about the 1st October, when I discovered from my house, which overlooks the field, that the carrot weeds on the afore-mentioned belt very far overtopped their neighbors. Upon examination, I found the white clover and *volunteer red* (having sown no clover this year) much better than elsewhere, and made up my mind that green-sand was a good thing for the clovers, if not for grain. In the spring of 1838, the poorest and most sandy parts of the belt put up a smart sprinkling of the bird's foot clover; the better, but still sandy part, as it encroached upon the really good land, had a most magnificent growth of white clover, (which was never seen there before); and on the balance of the belt there was a very fine crop of both white and red, varying with the quality of the land—much inferior on the *whiter* land, and where decidedly white and cold, no improvement at all. The belt, originally but ten feet wide, had now, by frequent ploughings and harrowings, during the cultivation of the corn and sowing of the wheat, spread out to fully 20 feet; and seeing the clovers as good at the margins as in the middle, I concluded I had wasted labor in putting on the green-sand too thick; therefore in the following year reduced the quantity to 600 bushels the acre. Spring of 1839—same field in corn—carried out and spread, as near as could be, 600 bushels green-sand to the acre, on about 25 acres, the belt included—crop fine throughout; saw no difference in any part of the field, not even on the belt where the clover was so fine, but which had been grazed down with the rest of the field the previous autumn. Sowed wheat in October—crop promising in spring, 1840, but lost by rust—no difference between the green-sand part of the field and other parts as to rust—observed no spewing up of the earths like that by frost, as formerly; perhaps owing to the smaller application of green-sand. In the spring, 1840, sowed the whole field with red clover seed; the growth most wonderful where the green-sand was used, and in the strong land during harvest a stroke of the cradle would take in as much clover, nearly, as wheat. White clover wonderfully luxuriant, and the entire 25 acres at this day exhibit marks of great improvement, with the exception of a few ends of rows running into the white land.

* This reference is to the queries published in 1837, in connexion with the general queries on marling, (recently again submitted to Mr. Carter,) and which were as follow: (Far. Reg., Vol. V., p. 511.)

"*Additional queries, addressed to persons who have used green-sand earth, not calcareous, or not effervescent with acids.*

Query 1. In what quantities have you used the earth called "green-sand" per acre?

2. On what extent of surface, and for what length of time?

3. On what kind of soil—and, especially, as to whether naturally rich or poor, and whether marled or not—has this manure been operative, or of no effect?

4. What crops is it beneficial to, and on what has it little or no effect?

5. Is its beneficial effect durable or transient—and to what known extent?"

It is worthy of remark that contiguous to the land already described as having received the green-sand, there were about 30 acres resembling it originally, but much impoverished by cultivation, upon which a very liberal supply of farm-pen and stable manure was spread at the time the other received the green-sand preparatory to planting corn. On both these parts of the field the corn was equally good—the succeeding crop of wheat however was much more promising, before the rust took it, on the manured part; but the clover very inferior to that which grew where the green-sand was spread. This appears a strong proof of the excellence of green-sand as a manure for clover.

Thus, Mr. Editor, have I answered four of your queries, and I hope at a future day, to be able to testify as to "the permanency of the beneficial effects of green-sand," which constitutes your fifth and last query.

Very respectfully,
your obedient servant,
WILLIAMS CARTER.

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Concluding Remarks by the Editor.

The preceding interesting communication on the use and effects of green-sand alone was not received until the 25th of November, after all the foregoing remarks and answers were in type. The facts stated deserve the attentive consideration of all who desire to understand the action of green-sand. No particular comments will here be offered; and it will be left to readers to draw their own inferences as to whether the effects just stated are most in agreement with my views before presented, or with the more authoritative and more prevalent opinion of this earth being a *general* fertilizer.

One more statement of practice in regard to both the early and later effects of green-sand, without any calcareous admixture or accompaniment, will be added—and which, indeed, is the only such fact known, except of my own former practice and experiments, on the general results of which have been founded the opinions stated at page 680, and in various previous parts of this journal.

The early effects of the trial referred to, were communicated by Dr. Braxton to the Farmers' Register, more than four years ago, and may be seen at page 277 of Vol. IV. After mentioning several smaller and less careful experiments with green-sand as manure, which, though generally producing good effects, and therefore encouraging the repetition, were not of a decisive character—because not entirely separate from calcareous matter, and, moreover, not observed beyond the early results—he proceeds thus to describe what may be considered as an accurate as well as a long continued experiment:

"But the most decided proof of its beneficial effects, was evidenced on cotton. I selected, as I thought, the poorest spot on the farm where I reside, the spring of 1835, (being a part of one of those cattle-starving, comfort-killing appendages, called a standing-pasture,) and fallowed up a few acres which I put in cotton; the whole was manured in the drill with coarse litter. On about 3 acres, the litter in the drills was top-dressed with green sand at about 100 bushels to the acre; but I should observe, that this green-sand was of an inferior quality to that used with the celery and corn, not being from the same deposite, and being the upper, or overlying stratum of the tertiary formation, containing about 30 per cent. of green-sand and 5 of gypsum, most of it having no lime at all. On another acre, old ashes in about the same proportion were applied, in the same way, and the cultivation was precisely the same on these 4 acres, as on the rest of the patch. Where the green-sand and ashes were put, I could see no difference; but between that, and where no marl [green-sand] or ashes were put, it was as *five to one*, or more. Where the green-sand and ashes were applied, the cotton was of fine size, and as well branched and bolled as I ever saw cotton, while that of the other was small and trifling—scarcely worth any thing."

The ground which was the subject of this experiment, after being in oats the following year, (1836,) has since, together with the field in general, been returned to its former use of standing pasture. I saw the place during my recent visit to Dr. Braxton, and under his guidance. There was a very thin sprinkling of red clover over the field generally, and this was somewhat thicker, and therefore the land might be considered as better, on the site of this former manuring than elsewhere. But this difference was so slight, that neither of us could trace any part of the former outline of the manured part, by the difference of the stand of clover, or by any other mark of superiority.

Neither was there any difference perceptible between the two parts manured severally by 100 bushels of drawn ashes and by 100 bushels of green-sand earth, containing (according to Professor Rogers' statement) 30 per cent. of pure green-sand and 5 per cent. of gypsum to the acre; and indeed it had been forgotten, and could not be recollected, on which side of the lot the two different manures had been used. Allowing every thing that can be now claimed by the most sanguine or confiding advocate of green-sand, the present superiority of the land so manured cannot exceed fifty per cent., if indeed it be so much; which is a diminution of seven-eighths, or more, of the superiority shown on the first crop. Moreover, of the small superiority still remaining, over the unmanured surrounding field, it may be questioned whether a part of it is not due to the 5 bushels of gypsum to the acre, even if all the effect of the rough putrescent manure be (as I can well believe) entirely at an end.

If no other benefit should grow out of this publication, and the suggestion of these doubts of the truth of scientific *dicta*, it is hoped that it will impress on the farmers of this region the high importance of testing, by accurate and numerous experiments, the value, and then ascertaining the kind and the limits of action, of green-sand as manure. In a single year, by multiplied experiments on various soils, different crops, and under different circumstances, all dispute and obscurity could be removed as to early effects; and by continued observation of the same experiments, or a sufficient portion of them, a few years' time would apply the test to the degree of permanency of effect. If such had been the course advised, and acted upon, when public attention was first drawn to the

existence of green-sand in Virginia, instead of a general confidence being yielded, without trial or proper evidence, in the asserted marvellous effects, the important facts would already have been proved; and the true value of green-sand might have been known and availed of—and the false and delusive opinions dissipated, and no longer allowed to lead to erroneous practice and loss. Such a course of experiment, on this, as on various other subjects, might well have been an effect of the labors of a Board of Agriculture, if the "penny-wise and pound-foolish" policy of the Virginia legislature, or its *penny-saving* and *pound-wasting* usage, had not refused even that humble and low-priced aid to agricultural improvement; and such a course of judicious experiments, even if limited to this one subject of green-sand, would have been more productive of information, and of profit, to the state, than all the discoveries and speculations to be found in the state geological reports, upon that and every other subject of research, put together.

TRANSPORTATION OF MARL ON THE PAMUNKEY RIVER, AND ITS EXPENSE.

To the Editor of the Farmers' Register.

Chericoke, Nov. 6th. 1840.

In connexion with the reports on marling, which you are now in the progress of publishing, it may not be without its use to some, to give you a detailed statement of the expenses attending the same, as the process is carried on by me; for I am satisfied many are deterred from the use of marl, when not having it on their own farms, from an erroneous idea of the supposed expense, in procuring it elsewhere. Whatever opinions may have been elicited, or whatever consideration the subject may already have attracted, every day's experience convinces me more and more, that the value of calcareous manures is not sufficiently appreciated, in the tide water regions of Virginia, or indeed I may add in all eastern Virginia, nor do I think it will be, till persons try the experiment for themselves. In this county, much good has already been done by marling, and there is certainly an increasing interest on the subject. Some have marled over all their arable lands; very many are engaged in it, and many are commencing, and many others preparing to commence. All, or nearly all, profess to admit its value, but still there are few who give themselves to the work, as its importance would seem to warrant. Although deposites are almost daily being found, where none were thought to exist, still there are many farms and neighborhoods, in marl regions, where none have as yet been found, or if found, are unavailing to the owners, from their locality; but which farms are in a few miles, either by land or water, of inexhaustible deposites of the richest marls, the most valuable and only permanent manures (save lime) which can be applied to our acid, and without calcareous matter, comparatively sterile soils. Still these owners are prevented from using the only means which can enrich their lands, by an indefinite idea of the expenses attending the use of marl, where it is not to be procured on their own lands. It is with the view of aiding the latter class chiefly, if this should come under the notice of any such, that I propose to make the following statement.

As I have already stated in my answers to your queries on the subject of marling, all the marl which I use, I bring 8 miles down the river. My boat is a decked, or what is called, a camel lighter. It is 48 feet long, by 12 wide, the sides 32 inches deep. When properly loaded, it carries about 600 bushels. Two hands man her very well, but they cannot make a full load in two days the time allotted for a load. This is easily done by 3 men the number usually carried, though 2 hands will bring down 400 bushels, in the above mentioned time.

The marl is wheeled in on barrows, some 10, 20 or 30 feet, as work is extended into the bank, and is discharged in the same way at the wharf or landing at home. At the above rate it would give 100 bushels of marl per day for each hand. Now estimating the value of each hand at $150 a year, for hire, clothing and feeding, allowing 300 working days, would be 50 cents a day, or $3 for the trip of 2 days. The boat only cost me $70 out of pocket; but the ship carpenter, who built her, said he could not build one, furnishing materials himself, for less than $300, so we will put it at that price; the interest on which, would be $18 per annum; and supposing the lighter would last 10 years, the common life allotted to such boats, it would be necessary to create a sinking fund of $30 a year, which would be an additional 10 per cent. on each $100; so that at the expiration of the 10 years, you would be reimbursed in the original cost, to which may be added for the annual repairs of the boat, $10, and wear and tear of implements used by the laborers, such as wheel-barrows, picks, grubbing hoes and shovels, $5, a liberal allowance, making, viz: interest $18+sinking fund $30+repairs $10+implements $5=$63 per annum, for boat expenses, &c. Now allowing the boat to run but 8 months in the year, would be but 208 working days, making 30½ cents per diem, or 61 cents a trip, which makes the actual cost of the marl at my landing (not paying any thing for the marl) $3.61 cents. per boat load of 600 bushels, or rather over half a cent per bushel. The expense of hauling therefrom, will depend upon the distance to be hauled, on the fields, which each one can best estimate for himself, and it will therefore be unnecessary for me to do it in this place. When spread on the land, I should think it cheap to estimate the intrinsic value of the marl at 10 cents. per bushel; which, at the rate I apply it, of 200 to 250 bushels per acre, would make $20 to $25 per acre, and I think I may safely say the enhanced value of the land, would be considerably more than that amount, as soon as laid on.

Perhaps larger boats, such as are used on the canal at Richmond, which carry, I have been informed, 1200 bushels of coal, would answer better; that is, be of more easy navigation, and carrying so much more, would make it cheaper, particularly if to be transported any distance. Such is my opinion of the value of marl, after an experience of some 8 years in its use, that I should not hesitate to carry it one hundred miles, on navigable water, provided it was good, and I could procure neither that nor lime nearer. Should any think the estimates I have made too high, or too low, for labor, he can alter them to suit his views; but

I do not think they can be so varied as materially to change the general result of my calculations. The marl of which I have spoken is entirely of the eocene description, and is found on this river (the Pamunkey) in great quantities cropping out on the banks, from 10 to 25 feet perpendicular. How much below low-water mark it goes, has not been ascertained, as we have never gone through it. The analysis of this marl I have given as according to Professor Rogers in my answers to your queries, it is therefore unnecessary to repeat it here. You may perhaps think by this time, Mr. Editor, that having bestrided my hobby, I have forgotten when to dismount. Not so—but such is my desire to see our tide-water country attain to the value of which I think it capable of being brought by good husbandry, and a judicious use of the means which have been placed for our use by the bounteous hand of nature, that I am anxious to place all the little experience which has fallen in my way, before my brother tide-water farmers, who are situated as I am, that if they think proper, they may profit by it.

CORBIN BRAXTON.

November 5th, 1840.

CURRANT AND BLACKBERRY WINES.

To the Editor of the Farmers' Register.

Nov. 20th, 1840.

At our late agricultural show, on the 13th and 14th of this month, at Fredericksburg, there were exhibited two samples of wine—the one of blackberries, the other of currants—both of which were so highly approved, that your readers, I think, will be pleased to have the receipts for making them. I therefore now send them to you for publication.

To make currant wine.

Gather the currants when ripe; mash them with your hands; to each gallon of mashed berries add one gallon of water; strain through a hair sifter; mix two pounds of brown sugar with every gallon of the strained liquor; and immediately bung the whole quantity in a clean cask, where it should remain twelve months before it is broached.

To make blackberry wine.

Pick the berries when ripe, squeeze out the juice by hand, and to every gallon of it add one quart of water and three and a half pounds of brown sugar. Mix the whole well together, and then bung it up in a clean cask or barrel, where it should remain twelve months before it is bottled.

The blackberry wine was preferred by most persons who tasted the two kinds; and one gentleman, who had frequently drunk the Scuppernong of the best quality, gave the blackberry wine the preference. Much credit is due to the lady who sent the sample of the currant wine, for she had made sixty gallons of it last summer twelve months, and a very pleasant drink it proved to be. The gentleman who sent the blackberry wine had made 16 gallons of this agreeable beverage, and has thereby demonstrated, that the vines and bushes which yield it, and which we agriculturists have heretofore deemed great nuisances, may be turned to profitable account. Quere, Would it not be a good spec. to substitute them for our multicaulis trees, although I have lately heard that a very ingenious process had been discovered, by which the leaves of the latter may be converted into excellent soup. For the truth of this highly interesting developement of multicualis properties I am not prepared to vouch; as I have neither tasted the soup myself nor seen any person who had done so. But another summer shall not pass over my head, (should I live to see one,) without a thorough investigation of this important discovery.

JAMES M. GARNETT.

PROCEEDINGS OF THE MASON, CABELL AND KANAWHA AGRICULTURAL SOCIETY, IN REGARD TO THE ESTABLISHMENT OF A STATE BOARD OF AGRICULTURE.

For the Farmers' Register.

At a meeting of the Mason, Cabell and Kanawha Agricultural Society, held at the town of Point Pleasant, in the county of Mason, on Thursday the 5th day of November, 1840,

The following preamble and resolutions were offered by George H. Patrick, esq., and unanimously adopted.

Agriculture, in its various relations, combines the most important interests of all civilized nations. The embellishment of civilization, the enlargement of commerce, the extension of arts, the developement of mineral wealth, and the growth of manufactures, are all in a greater or less degree dependent on the well directed and successful application of the capital, skill and industry bestowed on agriculture and its kindred pursuits.

It is the source of all permanent national wealth, strength and prosperity; sustains by its contributions, direct and indirect, nearly all the burthens of government and of society; yet, up to this period, in the legislature of Virginia, no effective measures have been adopted to impart new vigor to this leading interest of the state.

In Europe, as well as in most of the states of the American confederacy, agricultural boards have been established, schools of instruction endowed, and agricultural societies patronized with the happiest effects and most beneficial results. We cannot admit for a moment that the general assembly of Virginia is not fully apprised of the just claims of the great body of her agriculturists to every fostering measure which a wise system of laws and appropriations may administer to the enlargement of their pursuits and profits, by increased developements in tillage and culture, and new stimulants to improvement; but believe, while every patriotic feeling of that respected body has been in union with the advances of the age, they have awaited the expression of the public sentiment in favor of an efficient effort to collect and diffuse agricultural information and improvements in husbandry throughout the commonwealth. Seriously impressed with the importance of the subject, and with full confidence in the wisdom and patriotism of the legislature, this society comes to the following resolutions:

1st, That Gen. P. H. Steenbergen, John Lewis and the Hon. Lewis Summers, be appointed a committee for and on behalf of the society, to prepare and present a memorial to the next general assembly, praying the establishment of an agricultural board, with such suitable powers and duties, as to the wisdom of the legislature may seem proper.

2d, That adequate aid and encouragement may be given to all societies formed for the advancement of agriculture in proportion to some just standard to be fixed by law. And,

3d, That the foregoing preamble and resolutions be published in the Farmers' Register; and our agricultural brethren throughout the commonwealth invited to co-operate with us.

A. W. QUARRIER, *Sec'ry.*

TO SMALL FARMERS.

For the Farmers' Register.

I frequently hear small farmers say, "Ah! it is well enough for Mr. So-and-so to read the 'Register,' and try experiments; but it will not do for me." Neighbor, if this is your case, let me tell you that I am a small farmer, and I can testify that the reading of agricultural works has been of great advantage to me, and I am sure will be to you, if you will read them. Perhaps you will say that the correspondents of the 'Register' propose plans of improvement on too large a scale for you. This may be, generally speaking; but then, when we read, we must reflect how far *this* or *that* can be applied with advantage on our own little farms. And again, I know many small farmers who are fully competent to write for the 'Register,' and by not doing so they neglect to discharge a duty which they owe their brother farmers. The hand which is now using this pen, a few minutes ago was using the hoe—and to much better effect too—but, you see, Mr. Ruffin has not rejected this piece because my ideas are not couched in elegant or purely grammatical language.

But to the point. Small farmers should attend to small matters, and some big ones too; and the first of these is the improvement of their minds. The reading of agricultural works, as well as all other good books, has a powerful tendency to effect this desirable object. Next, the improvement of our morals. Let us have our consciences "void of offence towards GOD and man," that we may enjoy fully the bounties of Providence. Then the improvement of our little farms, which we should not only do as a matter of necessity, but as a duty which we owe to our GOD and to our posterity. This is to be done in a variety of ways. We should be as careful to store up food for our crops as we are for our families. No ashes, slops, bones, sweepings of the yard or kitchen, or litter of any kind should be lost, that can be converted into manure, and cultivate no land without its being manured well. Let a fruit tree be planted on every little unoccupied spot of ground near the homestead. Concentrate your labors on a small spot. Keep no more stock than you can keep well. Dispense with your useless dogs, and such like. Subscribe to the 'Farmers' Register' (or some other agricultural paper) and you will soon have cause (as I now have) to be thankful to the editor and his correspondents for the great benefit they have done you. Your farm will afford more profit and more pleasure; it will inspire a feeling of manly independence and gratitude to a kind Providence; you will be a fitter subject for a republican government; in short, you will attain the enviable title of A RICH POOR MAN.

KIDNEY-WORM IN SWINE.

From the Southern Cultivator.

We have taken some pains to make an examination in a case of this disease, which has resulted in exhibiting *facts*, important in fixing its character and which should be extensively known to farmers. We had met with various prescriptions for curing the disease, (which is known by the animal *breaking down in the loins,*) among which were the internal administration of arsenic, calomel, &c., and the application of spirits of turpentine to the back and loins—all of which proved abortive on trial.

This summer we had a fine barrow, in good thriving condition, suddenly taken down with this affection. There was a general paralysis throughout his whole frame, even his jaws being so much affected that he could with difficulty bite corn from the cob; but in his hinder extremities all strength was gone. We tried the above prescriptions, but without any visible effect. Determining patiently to await the result, we suffered him to linger out a miserable existence till within a few days ago, when he became so low and exhausted that we had him knocked on the head to terminate his sufferings.

On taking out and examining his kidneys, we found them perfectly sound, free from worms, or all trace of worms of any kind! We then extended our examination to the region about the kidneys, and found every thing in an apparently healthful condition, till we reached the spine bone—when, as indeed we had suspected, we found the seat of the disease.

Immediately over the kidney, we discovered a perforation in the spine bone, which ranged from the direction of the right flank to the top of the left shoulder, passing through and through the bone and marrow, large enough to admit the passage of a musket ball, and looking as if it had been bored by a worm as large as the common white grub. But to our surprise, we found no worm, nor any perforation in the adjacent parts indicating its escape. We have since conjectured that the worm was so much smaller than we had expected to find, on discovering the hole in the bone that we over-looked it, though present.—There was no indication of general decay in the bone—but all was apparently sound, with the exception of the round perforation above mentioned.

The investigation has satisfied us, that if the *kidney-worm* (so called) does exist, it does not perforate the kidneys—that the *spine* is the part affected--that the prescriptions above alluded to, and all similar prescriptions, are too impotent to give relief, and that, in truth, when a hog breaks down in the loins from this cause, there is but one sensible course to be taken, and that is to knock it on the head before it eats more corn.

We had before known that the spinal marrow is the seat of all nervous action—that all the nerves of the system distribute themselves on, and receive their vitality from it, and that whenever or from whatever cause, the *spine* is seriously injured, all nervous action below the point of injury is *paralyzed.* Hence, when we reflected upon what was the probable cause of the loss of strength in the hinder extremities of the hog, we suspected that an investigation would show it to be some direct or indirect injury to the spine. And the result has verified the suspicion.

We make known these facts, to save our farming friends all unnecessary trouble and expense in keeping and feeding hogs thus affected. It is better to terminate their existence at once; for all cure is out of the question.

SOWING GRASS SEED IN WOODLAND.

From the Southern Cultivator.

Near Colbyville, Ky., Oct. 14, 1840.

The woods should be prepared by burning the leaves, cutting up the logs and brush, and burning them, and thinning the woods so as to allow the sun's rays to shine upon every part of the ground some time in the day. It is usual to kill, or cut out all the sugar tree, elm, box-elder, iron wood, and every thing else that will not make rails or saw logs. When the ground is ready, it is a matter of much importance to sow upon it such seed as is suitable to the soil. If there is lime in the soil and not much sand, blue-grass* will be suitable for it. If there should be much sand in the soil, then some grass with stronger roots than blue-grass would be necessary to prevent its being pulled up. Orchard glass and the clovers would be better in such cases. Blue-grass generally succeeds well upon land that has some or all of the following trees—ash, sugar tree, white and black walnut, locust, wild cherry, box elder, buckeye, elm, mulberry and hackberry. Where oak and hickory predominate, orchard grass generally succeeds well.

Where there is *lime-stone*, there is a strong presumption there is *lime in the soil*, though it is not invariably the case. To ascertain certainly whether there be lime, take one part of muriatic acid, and two of water, and pour the mixture upon a portion of the soil in a glass tumbler, and the quantity of bubbles will be in proportion to the lime. If the earth has been weighed, the fluid poured off, and potash be added, the lime will fall to the bottom, and dried and weighed, the proportion can be ascertained. After it has been determined what seed to sow, it is important to have them of a good quality. Blue-grass seed is often injured by heating after they are gathered. They are bought by our merchants in large quantities, and are put in bulk, and not being quite dry they sometimes heat and destroy their vitality. When this is the case, it can be known by the smell, which shows that a rotting process has commenced. Good seed should smell like well cured hay. Clover seed will come up at almost any age, yet clover seed more than a year old is not worth half as much as fresh seed; for although it will come up, it will not all come together, but at different periods, so as to make the crop very uneven. Fresh clover seed may be known by their brightness, each seed appearing as if it had been glazed.

Blue-grass and timothy may be sown at any time from September to April. A snow is usually chosen to sow, because the seeds may then be distributed more evenly without the trouble of marking off the ground. And I have generally sown blue-grass first, and then crossed the ground in a different direction with timothy. The blue-grass seed will be distributed more evenly by being well rubbed so as to separate the seed, which are stripped in bunches.

After the seeds are sown, all the cattle on the farm should be put into the woods where you have sown them, and fed there with hay or stock-fodder or whatever they are fed with, and kept there until the seeds begin to sprout, when every thing should be taken off, and nothing allowed to go upon it again until the grass has seeded, when it may be heavily stocked. The object of putting the cattle upon the ground after sowing the seed is that they may tread it into the ground. If sowed late, the grass will not seed the first year, and the temptation will be very great to turn stock upon it, and some of our best farmers recommend it. My experience is against turning on any stock until it has seeded.

My land suiting both timothy and blue-grass, I have generally sown both upon it, in the proportion of a bushel of each, in the chaff, to the acre. In a few years the blue-grass takes entire possession of the ground, expelling all the timothy. The advantage of sowing timothy with the blue-grass is, that the timothy is a quick growth and takes possession of the ground and affords considerable pasture before the blue-grass comes on, keeping out weeds, and yielding to the blue-grass as it gets stronger. The blue-grass is very weak the first year, but becomes a strong hardy grass afterwards. Blue-grass is not killed in the winter, and affords much food at a time of the year when green food is particularly valuable. As blue-grass is tender the first year so it is also early in the spring; and if grazed close in April and May, it will afford very little grazing the balance of the season: but if permitted to get a good start in the spring, it will afford an abundant supply during the whole season. A few years ago, I sold some beef cattle in October, off a piece of woodland pasture of seventy-six acres. The fall was favorable to the growth of grass—and in December I put upon it twenty horses and my flock of sheep, (upwards of one hundred,) and they were well wintered upon the grass with only two loads of hay during the winter. There were only two snows that winter that lay several days on the ground, and at each time a load of hay, supposed to be about half a ton, was hauled out to them. My sheep are wintered every winter in this way, and the wethers are sold in the spring as soon as sheared for the highest price that mutton commands.

Formerly, most of the trees a foot in diameter, and under, were cut down and cut up and burned; now, the trees that are not thought valuable for timber are all killed by chopping around them, and they are allowed to fall, or are cut down at some leisure time and burned. Trees may be killed at any time of the year, but the best time is in May, June, July and August.

SAMUEL D. MARTIN.

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* Green-sward—*poa viridis.*—ED. F. R.

REPORT ON ARBORICULTURE.

From the Carolina Planter.

Your committee would respectfully submit that few objects excite the surprise of foreigners of intelligence more than the total neglect of fruit in the southern portion of the United States. This is neither complimentary to our good sense, industry, or fine taste.

In all European countries congenial to the culture of fruit, great attention has been bestowed on this branch of rural usefulness—not only by those who have abundant means for the perfection of the different varieties cultivated, both by the aid of science, and abilities, which would require solicitous care to be bestowed on these mute friends of the human family, but even the humble cottager, who subsists on the daily pittance which his labor yields to him, takes an honest and laudable pride in his small though well cultivated garden, whose bowers are composed of trees, the branches of which bend to man, their benefactor, and gratefully yield to him the choicest and most delicious fruits of his clime, which administer abundantly to the frugal wants of his homestead and family—affording delicacies that cheer his toils, and which in winter contribute to his enjoyments, and arouse his expectations, by reminding him that other seasons will soon roll round, when the dreary looking earth will again be robed in flowers, and bear again the beautiful gifts of GOD's blessings to his dependent children.

What credit is this reflection to the citizens of South Carolina, who have such abundant means, so much leisure, and such a congenial climate, all of which have been ill applied, if applied at all, or at least have settled into the apathy of indifference, on a subject, which, if properly considered, would not only be beneficial, but which would eventually become a source of the most elevated satisfaction.

In South Carolina, on some plantations, scarce a fruit tree is to be seen—and even if a few stinted subjects are occasionally observed in their general impoverished and wretched condition, seeming struggling to raise their puny heads above the mother earth which affords no congenial food for their numerous and greedy organs, we are convinced that they can afford no profit, and from their sickly appearance we derive no pleasure. This very feature, in what are here termed orchards, has caused many persons to conclude that fruit will not thrive in our happy clime: yet, it gives your committee great pleasure to be able to report, that fallacy in this, as well as in other matters, may be exposed and subdued, and that with proper culture many choice varieties of the principal and most substantial fruits which exist, viz: the apple, pear, cherry, peach, nectarine, plum, apricot and quince, may be cultivated with complete and brilliant success.

It is not alone for the mere gratification of the animal appetite that we recommend their culture—they administer to the wants of the mind as well as to those of the body. We are endowed with other senses than that of taste—faculties which contribute to the exalted enjoyments of life. He who reads a page of pure morality from the trees loaded first with flowers, and admires in these flowers as they are scattered by the breezes of heaven, to be succeeded by the richer gifts of fruit, grateful to the eyes of the children of the earth, the wonderful handiwork of the Creator of the universe, possesses a source of satisfied happiness, which must ever be unknown to the mere worldling. Thus our daily walks may lead to a consideration of his goodness—also, of the created wonders of his vegetable kingdom, urging upon us the conviction that to assist nature and bring forth perfectibility in her operations by the means and intelligences with which he has endowed us, must ever be the most laudable and least reprehensible pursuit which can occupy the attention, and engage the energies of mankind.

To descend somewhat into detail, each person who wishes an orchard with trees of the "*life-looking*" kind, should procure, as a commencement, a few varieties of the most choice fruit, which can be done at an expense and trouble, trifling, when the return which they will yield is considered. In a few years they will begin to reward him for the care he may bestow on them, and this return will increase in proportion to the application and free bestowal of that care. Having in this manner obtained a start, their numbers can be multiplied by various processes, which we shall describe under their respective heads—and in connexion with this operation the rising family may be instructed in these various manifestations, which may be of as much importance to them at a future period, as any other branch of knowledge may be should their wants require it.

Additions and exchanges may be made with ease, that ere a man, who has never bestowed attention on an orchard, could imagine an assortment completed, he would be startled to find that the energetic orchardist had already under his care, trees which had drawn their natal nourishment from every fruit-yielding country of the world. From a limited acquaintance with fruits, both native and foreign, during a few past years, your committee ventures to assert that to more than nine-tenths of our citizens are the most choice varieties of fruit unknown even by name, and but few of the best fruits have been cultivated any where in our state.

The chairman of your committee has procured, and has growing with promising success, nearly every celebrated variety of fruit both foreign and native—many from England, France, Germany, and Holland, which are there held in high repute --but the experiment has yet to be made, whether they will suit our climate, yet from present appearances he is sanguine of complete success, and when they fruit this society shall be informed of the result of the experiment.

Such foreign fruits as have already proved themselves to be adapted to our climate, and those native varieties which are worthy of propagation and culture, will be given in a list under their respective heads.

Within the last twenty years great attention has been bestowed on this department of horticulture throughout Europe, during which time many new and valuable varieties of fruit have been produced by the aid of science and skill, and thus variety after variety has been acquired—in some a preponderance of size having been obtained, whilst in others flavor has been transferred from some choice kind, and by these means the requisites of fine flavored and large sized fruit has been the desired effect.

To Prof. Van Mons, of Belgium, are we indebt-

ed for many experiments on the pear and apple, and for many new and valuable varieties of these fruits. By impregnating the flowers of one kind with the pollen or farina of another, and planting the seed thus matured, a new variety is invariably produced—sometimes partaking of the qualities of both, yet, often superior to each, which shows the necessity of grafting and budding, when a particular variety is to be increased, as all are liable to mix whilst in bloom, the wind wafting the farina gently from flower to flower. It is owing to this promiscuous intermingling of different kinds of trees that we see so many varieties of fruit; occasionally a superior variety is produced from seed, and again a favorite lost.

In order to facilitate a thorough knowledge of propagating, and introduction of good fruits among us, we will give brief directions for the most popular modes of propagation, and a list of the most approved varieties of fruit.

Budding.—This mode has several advantages over grafting: it is more readily performed, with fewer implements, less preparation, and with greater success, it does not injure the stalk if unsuccessful, as is the case in grafting, and the operation may be repeated several times during the season, as its performance is protracted for some one or other of the varieties, for three or four months. June, July and August is the proper season for budding the apple and pear. The cherry should be budded early in June, while the plants are in thrifty growth. The plum should also be budded in June. And the peach and nectarine may be done as late as September.

The first consideration is to provide stocks, if this provision has not been made. Seeds may be collected with ease—those of stone fruit may be deposited in a hole in the garden, and buried superficially in autumn, to expose them to the expanding influence of the frost. Early in the spring plant in drills which have been well prepared, and made rich with good soil, or decomposed manure in order to shove the young plants with vigor. If they have been well treated, the peach can be budded in September following, and they usually succeed best if worked on young stocks of the first year's growth.

A bud is an organized plant in embryo, with roots, branches and foliage, and, like a seed, capable of the reproduction of its species. The process of budding is the transferring this embryo plant from the parent tree to another tree of the same genus, if not of the same species. To render this successful, it is necessary, 1st, that the bud be in a proper condition to transfer. 2d, that the stock be in a condition to receive and nourish it. And lastly, that the transfer be skilfully made. The principal precaution should be to choose young, healthy wood, full of sap, the bud should be matured and peel freely, as this is necessary for the insertion of the bud, and indicates the presence of the cambium, which is the soft partially formed wood under the bark, and is the source of nourishment to the bud, and the bond of union between it and the stock.

There are many modes of inserting buds, but we shall confine ourselves to the most successful method—Shield or T budding is thus performed—select a smooth part of the stock, rather from than toward the sun, make a horizontal cut across the rind into the wood, from the middle of this transverse cut, make a slit downward an inch or more in length—the thin end of the haft of the budding knife, or if you have not a budding knife convenient, the thumb nail will answer as a substitute, is then to be applied to the top of the incision, which is done by gently raising the top, and running the end of the haft downward on each side to the end of the incision. The incision being made for the reception of the bud, the next thing is to prepare the bud by placing the scion in the left hand, the knife must then be inserted more than half an inch above the eye, and drawn through half an inch below the bud, cutting it out with nearly half the wood, cut the bark off square, half an inch above the eye, before taking out the wood, to fit the transverse cut in the stock; this done the wood is to be carefully taken out, and it is then to be inserted neatly into the incision, by pressing it gently down between the bark and wood on the tree until the bud fits neatly with the transverse cut in the stock. Bind it carefully with a strip of cloth $\frac{3}{4}$ of an inch in width, beginning first at the bottom of the incision and then continuing it to the top, over and above where the cut is made, taking care not to let the bandage cover the eye. Cut off the top of the stock to within 5 or 6 inches of the bud. In ten days after budding, such as have adhered may be known by their fresh appearance at the eye, and in three or four weeks, all those which have succeeded will be firmly united with the stock, and as the buds are now beginning to swell, the ligatures should be taken off. The shield and bud now swell in common with the other parts of the stock; nothing more is required than to keep the stock free from shoots, so that the bud may receive the full force of the sap, and before the rising of the sap in the spring they should be headed down close to the bud by an oblique cut terminating an eighth of an inch above the shield.

Grafting.—March is the general season for grafting, in this latitude, though it is occasionally performed earlier or later. The scions for grafting should be cut before the buds begin to swell. The grafts are most likely to live and thrive if inserted when the sap circulates freely, for then the wounds soonest heal.

The materials and implements necessary for grafting are

1*st.* A sharp knife to cut and pare the grafts and stock:

2*d.* A strong knife and small mallet, to split the larger stalks, and a small iron, or hard wood wedge to insert in the cleft while the scion is fitted to its place:

3*d.* Strips of cloth on which have been spread some grafting wax, to bind the stock and graft. A grafting wax which we have used with great success is made by mixing and melting together four parts of rozin, two parts of tallow, and one of bees wax; this may be applied over the grafted part in a thin layer, or in case of small stocks, on strips of cloth, as recommended above, and bound around the wound. The wax is applied—

1*st.* To prevent the waste of sap from the wound.

2*d.* The too sudden drying of the wood, and

3*d.* Exclusion of rain water from the cleft.

Success in a measure depends on the exclusion of air and water. The object to be arrived at in the process of grafting is to bring the inner bark and the sap wood of the stalk and scion in nice

contact; so that the ascending sap of the stalk will pass freely into the sap wood of the scion, and the descending sap of the scion, which has been elaborated, and prepared in the leaves, and which descends through the inner bark, to pass freely into the inner bark of the stock; this elaborated sap soon harden into wood, and covers and heals the wound.

There are a great many modes of grafting practised by professional nurserymen, but we will confine ourselves to one or two best adapted to the practice of the nursery and orchard.

Cleft grafting—is most readily performed and mostly practised. Cut off the stalk horizontally, make the cleft through the centre, in this insert the wedge, the scion is then formed in the shape of a wedge, taking precaution to make the inner side somewhat thinner than the outside, so that the bark of the stock will press on the outer bark of the scion: shoulder it neatly, and insert carefully; the shoulder is made to retain the graft in its proper place, and the better to enable a union to take place; for it will really be perceived that it has the additional chance of uniting on the face of the stalk. This process can be used in heading large trees in the orchard, as well as on small stocks in the nursery.

Whip grafting is generally performed on small nursery stocks, and is universally practised in the nurseries of Great Britain, France and Germany. It is performed by cutting off the stock at the place selected, in a neat sloping manner, then with a sharp budding knife from the smooth part, next to the lowest part of the cut, shave off the bark and wood two inches in length, beginning at the bottom by drawing the heel of the knife gently in the bark and gradually cutting deeper into the wood until the blade is drawn out at the top. The graft is prepared by cutting it in a sloping manner in a reverse position, so that when placed on the cut of the stalk it forms a neat splice. When the graft is set, it is to be bound securely with a stripe of cloth on which has been spread some grafting wax. The French and German mode differs from the English in their never paring off more of the stocks, however large, than the width of the scion requires.

Grafting under the surface of the ground is very convenient to grow young trees in the nursery; the stocks are cut off a few inches below the surface and the scions inserted. It is particularly adapted to the plum, cherry and apricot; they can all be easily propagated in this way.

Planting.--The planting of fruit trees being for utility, every precaution should be used to forward the intended purpose by the best means. Care should be taken to give them a vigorous growth when young, in order to form a strong healthy subject at a future period. It being our object to cultivate the most approved kinds, it should be borne in mind that they have attained their high reputation in most instances from the greatest care and the best culture. The cherry and apple, when planted too deep, lose their original roots, and are forced to throw out new roots from the stem near the earth's surface. The pear strikes root deeper for its support, and is most thrifty and productive in good soil with moist clayey subsoil, and if in a situation not too much exposed will generally produce good crops of fruit. The plum requires rich and rather moist soil to insure good crops of large fruit; it is however very productive if planted with care in yards and along lanes. The apricot requires a location similar to the plum, and will thrive wherever the plum can be cultivated with success. The plum and apricots being thin skinned fruits are more subject to the attacks of the curculio than others; to prevent which, plant in yards and along lanes where the ground is rich and trampled, and where pigs and poultry can have free access in picking up the waste fruit. Where this cannot conveniently be done, they should be well shaken once or twice during the week, and cast to the hogs. The best location for the quince is a rich loam where it is continually moist, hence it is that it usually flourishes well by the sides of drains. A good loamy subsoil is of the greatest importance to the full developement of its fruit.

If possible, particular care should be taken in selecting a suitable situation for the orchard, a good level piece of land, if it be so located as to lie a little descending to the southeast is to be preferred, as in that situation it will receive the warming influence of the sun in the spring, so congenial to the growth and maturing of the fruit. The quality of the soil is the next important consideration; a rich mellow loam, with a clayey subsoil, will be found to answer most kinds of fruit. When obliged to plant trees on a sandy or gravelly soil, we would advise the experiment to be made, of incorporating ditch or pond mud, with a small portion of lime or leached ashes, or clay in less quantity with a suitable portion of compost manure spread on to the depth of several inches, would be sufficient when apple and pear trees are to be cultivated. When cherry or plum trees are to be grown, it is advised to cast on a sufficient quantity of rich loam, &c. For plums, when it is practicable, perhaps a third part of marsh or pond mud may be used with advantage to make the soil of the proper depth. Where peach trees only are to be planted, a light dressing of compost, consisting of stable manure, ashes, and loam, will answer the intended purpose.

An error which has been practised here to some extent, is that of planting too far apart, thereby exposing the trees to the scorching rays of the summer sun, the fruit will always receive sufficient warmth for ripening, if pruned regularly. From 16 to 18 feet is the best distance that can be adopted in this latitude, they will be more durable and thrifty, and when fully grown will shade the ground, and thus protect the trunk.

January and February are the proper months in this climate for transplanting fruit trees; the holes should be made from 3 to 4 feet in diameter and 2 feet in depth. If the land is somewhat exhausted fill up with good rich loam, or mould from the woods, a foot or more in depth—then place the tree in the centre of the hole, taking care to spread the roots well, and not to place it more than two inches deeper than it stood in the nursery—fill in the finest and best mould on the roots--the assistant gently shaking the tree to enable the fine mould to run in among the roots and fibres. As the earth rises about the tree, gently tread in until all is level. Fix in a good stake, and tie it fast to the tree at the top, crossing the bandage between the tree and stake, to prevent the bark from being rubbed. It is advisable to have some straw put around the trees the first season, to prevent eva-

poration, this will be of inestimable service in the event of drought. The ground about the trees should be kept clear of grass and weeds, and no crops should be grown near the trees, as they deprive them of the warming influence of the sun, and the surface nutriment. The orchard grounds should be made rich, and should be kept so, after the trees arrive at a bearing state.

The following remarks, by Sayers, on the pruning and formation of fruit trees, are so well expressed, that we take great pleasure in giving them a place.

"To form a tree properly it will require to be pruned and regulated when young, in order to bring it into a proper shape and fruitfulness. Supposing the tree to be two or three years from the graft or bud, a head must be formed at the intended height by heading it down in the spring, to two or three buds or eyes in each shoot that is near the crown, when the young shoots begin to grow; they may be taken off to three or four in number of the healthiest, as they are intended to form the tree. During the summer, the young shoots may be cleaned of any insects that may be detrimental to them. In the following spring, the trees must be pruned in such a manner as to form a regular handsome head. It will be recollected that is the proper time to form a handsome tree, as each branch being formed from a common centre, draws sap in proportion to its luxuriance; and they afterwards form laterals or side shoots in proportion to their vigor; therefore it must be evident to every intelligent observer, that the formation of a tree in its infant state, is of the greatest importance. It will be often seen that one shoot is more luxuriant than another, which is owing to its being of a more succulent nature, and consequently draws a greater proportion of sap; by heading down those shoots to three or four eyes in the spring, the luxuriant will be divided into so many parts, and bring it on a balance with the other parts of the tree. This method may be continued for two or three years, when the habit of the tree may be seen. The *port* or *habit* of fruit trees should be considered, as the laws of nature are not easily reversed to any advantage, consequently they should be as much as possible cherished; for by practical observation, (which is always the best guide to perfection) it will be seen that some grow in a pyramidal form, some conical, and others form a regular head of an even circumference at the bottom, and tapering on the top in the form of a *dome*. The first of these habits, the pyramid, is beautifully exemplified in some varieties of the cherry. The second, forming the shape of the dome, is generally represented in most kinds of apple trees —and the conical is often beautifully represented in the cherry and many kinds of pears when young.

"In the art of pruning, the first thing to be attended to, is the port or habit of the tree, which should in all cases be kept in its natural order, by pruning in such a manner, as to encourage the most healthy parts of the tree. The next thing to be attended to, is in procuring proper tools for the purpose, which should be of the best quality."

Your committee would further add, that the advantages of summer pruning should not be overlooked, as there is then a brisk circulation of sap, the wounds are speedily healed, and protected by the foliage from the effects of the sun. In pruning it should be recollected that all shoots which are amputated from the tree while young, heal better than when old, and that the shoots should be so taken as to leave the wound on the tree in a sloping manner downwards, to let off the water freely. The experiment of summer pruning need only be made on a few trees, and the old practice of winter pruning will be abandoned.

In recommending varieties of fruits for cultivation, we shall name such as have proved good, and which ripen at different times, and in the order in which they ripen. A list of all the good fruit collected by the Chairman of your committee would swell this article to a tedious and useless length.

Apples.—Sinclair's yellow June, early harvest, *sine qua non*, summer Pearmain, summer pippin, Miller's aromatic, a native seedling variety, summer seeding, from seed, by the chairman of the committee, King's apple, produced by Mr. King of Spartanburg, fall pippin, English red streak, bullock pippin, bell flower, Cumberland spice, seek no further, Esopus Spitzenburg, Newtown pippin, Hun's fine green, French green, carthorse, Columbia russeting, wine sap.

The following apples are of the latest introduction, among which are the new varieties that have been particularly noticed by the London Horticultural Society: also, the choicest new German varieties; described in the works of their most celebrated writers.

Ornsbrucker's gros, rennette, saffron, Gravenstein, Emperor Alexander from Russia, spring grove codling, and black coal, from London, golden Harvey, court apple, or mile Carle, Revalesher red Reinette. Niemans rothe, zimmetarliger, muntineski.

Pears.—Ripening in July and August. Early Catherine, green Chissel, Bartlet, large Portugal. Autumn pears, ripening in September. Seckel, Doyenne Virgalien or St. Michaels, musk spice, Holland table pear, swan's egg, belle et bonne, Buffum's St. Ghislan, Moore's pound.

Late autumn pears, ripening in October. Autumn bergamot, beurre bose, beurre diel, Flemish beauty, heath cot, Bleeker's meadow. Winter pears beginning to ripen in October and November. Burgomeester, Hungarian, English queen of pears, present royal des Naples, Cattilac Moore's Merrimack, Passe Colmar, Colmar Sovereign, Easter beurre, Rose lench—Napolean—Echasserie.

Plums.—General Hand, Huling's superb—Yellow egg—red egg—blue egg—green gage, blue gage—prince's—imperial white gage, Bolmer or Washington, damased Mageron, Quesche or German prune, White prune, Corse's largest purple, Duane's purple, French, Reine Cloude—Bingham.

Cherries.—May duke—early Kentisk—carnation white and red Bigareau—yellow Spanish Napoleon Bigareau, black eagle—-Waterloo, Elton —Cumberland seedling—-Saml. Cline's cherry. Furne's large red—Black mazard, elk horn.

Apricots.---Large peach, monstrous peach, orange Roman cling, Roman free carpentras, Dark musk, apricot of Noor and peach leaved purple, common plum.

Nectarines.—Scarlet, Petersburg, aromatic Varmish, Elruge.

Peaches.—We shall not attempt to give a list of this delicious fruit, as there are several esteemed varieties amongst us: the early varieties and the

heath Peach should be included in every collection.

Quince.—Portugal quince of superior flavor, large orange, large French and musk.

By selecting from each variety you will be enabled to make an excellent collection, which will give a succession of the most grateful, and at the same time healthful delicacies and luxuries of the table—and at the same time has a powerful influence in attracting men to their homes—and on this account every encouragement given to increase a taste of the kind, is additional security for domestic comfort and happiness.

WM. SUMMER, *Chairman.*

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The apprehensions which prevailed, of war in Europe, are almost entirely dissipated by the recent intelligence from thence, and commercial operations will no longer be affected by fears of that event. But while the news is pacific, it is at the same time by no means favorable to the mercantile (and consequently to the agricultural) interest. The heavy drain of specie from England to the continent had induced the bank to adopt, as it is termed, "very stringent measures," and the scarcity of money was severely felt. Interest had been paid in London, on the very best securities, at the unusually high rates of 7 to 8 per cent. per annum. And while this state of things continues commerce must languish.

Although the consumption of cotton is on a larger scale than at any previous time, and although the reports of a diminished crop in this country had reached Europe, yet the price continued very low, and little encouragement is held out to expect any material advance at an early day. The immense import from the United States during the last season, and the accumulation of both the raw material and of manufactured goods, tends, with the scarcity of money, to produce this effect.

The duty on flour had advanced in England to 14 shillings per barrel, and the price was 33s. duty paid—price in bond 23s. The export from this country has consequently ceased.

Kentucky stemmed tobacco is supplanting Virginia to such an extent, that the latter is in a great measure unsaleable, but fine Virginia leaf still retains favor. On the continent prices of low qualities had declined.

New leaf tobacco sells at $5.75 to $7.25—lugs 3.75 to 5.25. Supplies as yet are moderate, except of loose, in which state a good deal is now brought to market.

Cotton commands 8 to 9½ cents—little at either extreme. The demand for our domestic goods has increased, and a large portion of the cotton crop of Virginia and North Carolina will be manufactured within those states.

The home supply of wheat is so inconsiderable that the article is now shipped from Baltimore to Richmond. The quotations at the former place are 90 to 98 cents—at the latter 100 to 110; and more for fine white. In Petersburg the mills are frequently idle for want of grain.

The price of flour is $4⅞ to $5, in all our exporting markets, except for city mills. Corn 45 cents. The price of pork is not yet established—no droves having yet arrived from the west. X.

November 27, 1840.

PETITION TO THE CONGRESS OF THE UNITED STATES, TO EQUALIZE THE RATE OF POSTAGE ON NEWSPAPERS AND OTHER PERIODICAL PUBLICATIONS.

To the Senate and House of Representatives of the United States:

The petition of the subscriber, the editor and proprietor of the Farmers' Register, respectfully showeth:

That the rates of postage on periodical magazines and on newspapers, as established by law and by usage, are so unequal, and so much higher on the former class of publications, as to operate to their discouragement most injuriously, as well as unjustly.

That the postage charged on newspapers (and all other periodicals, which by misconstruction of law are permitted improperly to pass through the mail as newspapers,) is one cent per sheet for any distance within the state wherein published, or to any distance without the limits of the state, not exceeding 100 miles from the place of publication, and one and a half cents to all greater distances in other states; and on periodical pamphlets or magazines, the charge is one and a half cents for all distances not exceeding 100 miles, and two and a half cents, even though within the same state in which the publication issues, for all greater distances. These different modes of assessment forbid any precise or accurate comparison of the amounts; but on a general average there can be no question but that the postage charged on periodical magazines, per sheet, is at least double of that on newspapers; and if estimated according to the respective weights or sizes of sheets, the postage paid on the former is six-fold greater than that on newspapers of large (yet not the largest) size now published.

That, on the Farmers' Register, an agricultural magazine established and conducted by your petitioner, the postage paid, on a general average, is more than $1000 for each 1000 copies of the annual publication; while large newspapers, if distributed to like distances, are charged, in proportion to weight, but one-sixth as much as the Farmers' Register. Consequently, five-sixths of the tax upon the latter is so much in excess, and that excess operates as so much discouragement to the publication, and to the same extent causes a lessening of useful effects of the work, and obstructs its object, the improvement and benefit of agriculture.

That another discriminating burthen on magazines, and bounty to newspapers, is presented in the legal privilege of all copies of newspapers exchanged between publishers being exempt from postage, while that privilege is withheld from periodical magazines. The amount of weight of untaxed papers thus added to the mail transportation, by the free use of this privilege, cannot be estimated; but it is certain that the addition thus made forms a very considerable proportion of the whole amount of mail freight, and of the expense of the post-office department, and also increases the unjust burthen on the publications to which the

bounty is denied, and which nevertheless pay otherwise the heaviest charges of the general expense of the post-office department, so far as defrayed by the transportation of printed papers.

That one effect of the unjust and impolitic discrimination between magazines and newspapers, serving, as it does, as a prohibitory tax on the former class, and a protecting duty for the latter, has been to cause sundry monthly and other periodical magazines to assume so much of the outward form of *newspapers*, (though still altogether different in law and in fact,) as to pass for, and to be charged as newspapers, by the misconstruction or favor of the post-office department. Thus, every publisher of a monthly magazine who can obtain this favor, thereby secures for his publication an indirect bounty from government, equal in amount to the great existing difference of the rates of postage.

That the inducement to obtain the benefit of this bounty is so great, that, if the present law and its construction remain unaltered, every agricultural, scientific and literary periodical, which has not already been degraded in its mechanical execution and form of publication, by assuming the disguise of a newspaper to secure this bounty, will be compelled to make the change of form necessary for that purpose; and thus, by a great sacrifice of good appearance and of real value in such publications, and to the lessening of their permanent utility, the post-office department will lose even the poor gain now derived from the discriminating and unjust burthen imposed on periodical magazines in pamphlet form.

That your petitioner, neither for himself, nor for the great agricultural class to which he belongs, and which his publication aims to serve, asks for any bounty or exclusive benefit; but merely that such publications as his shall be placed on equal ground as to postage charges with others now more favored; and he respectfully submits to the consideration of your honorable body, whether, as a matter of governmental policy, it is proper that every newspaper, of whatever character or object, should be aided in its establishment and subsequent support by the bounty of receiving free exchange papers, and the more extended protection of lower postage on all their issues, while other periodicals, designed to instruct and to improve, whether in agriculture, in the arts, or in literature and science, shall be subjected to a tax operating either as greatly discouraging, or altogether prohibitory.

Therefore, for the reasons set forth, your petitioner prays for such modification of the post-office law, as shall, on all periodical publications, whether newspapers or magazines, make the charges of postage equal, according to their weights, or to the extent of surface of sheets conveyed by mail.

All which is respectfully submitted.

EDMUND RUFFIN,
Editor and Proprietor of the Farmers' Register,
Petersburg, Va.

[The foregoing petition was sent on last winter to be presented to both houses of congress; but the members of those bodies, and friends of the petition, to whom the presentation was entrusted, thought it best to defer it, as no such matter could possibly be acted on, or even heard, during the last session. Perhaps the shortness of the approaching session may operate to prevent a hearing as much as did the *business* of the last long session. At any rate, the petition will be presented; and, so far, the humble efforts of the petitioner used to induce the removal of the enormous injustice and bad policy which exists, and which presses so injuriously upon every periodical publication, other than newspapers, and those which, to evade the discriminating tax, assume something like the form of newspapers, and are favored in that evasion by the partial and palpably erroneous construction of the post-office department.

All publishers of periodical pamphlets, on literature, science, or any of the useful arts, as well as on agriculture, are equally interested in the object of this petition; and it is probable that the *excess of tax* imposed on them by the existing unjust law, and incorrect and still more unjust usage, over and above what newspapers would pay in postage, amount to more than all the clear profit on these publications. And though this tax is levied upon, and paid by, the individual subscribers, it is not the less at the cost and to the injury of the publication, as its amount just so much increases the expense to subscribers, and discourages their purchasing such publications.

All subscribers to periodicals, also, as payers of this excess of postage, are interested individually in having it reduced to fair and equal rates; and still more the community at large, who, by the prohibitory operation of the tax, are debarred from a large portion of the benefits which might be otherwise obtained from the circulation of magazines.

The petititioner, therefore, hopes that he will not be permited to act alone in this matter, but be strengthened by the concurrence and influence of the many publishers who are alike interested in the object, and by some of the many thousands of other persons who, as readers, and members of the community, have a still more important interest in the result.—ED. FAR. REG.

WORCESTER [MASS.] AGRICULTURAL SOCIETY.

From the New England Farmer.

Report on fat cattle and milch cows.

The committee having attended to the duties assigned them, beg leave to offer the following report:

The number of fat cattle offered for premiums were ten, viz:

By Gardner Wilson, of Leicester, one fat ox, weighing 2285 lbs., six years old.

By Luke Baker, of Rutland, two fat oxen, weighing, 2215 lbs., the other 2285 lbs., seven years old.

By Jedediah Estabrook, of Rutland, two fat oxen, weighing, one 2195 lbs., the other 2125 lbs., seven years old.

By L. & E. L. Barnard, of Worcester, three fat

oxen, one weighing 2580 lbs., one 2260 lbs., and one 1980; two of them eight years old, one seven years old.

By Silas Dudley, of Mendon. two fat oxen, one weighing 2350 lbs., the other 2100 lbs.

Also, one fat cow was offered for exhibition, by John Boyd, of Shrewsbury, weighing 1790 lbs. No premium is offered by the society for fat cows. The cow exhibited by Mr. Boyd was a very fine animal, and he is entitled to the thanks of the committee for his public spirit in offering so good an animal, without the prospect of pecuniary reward.

The committee were highly gratified with the exhibition of fat cattle, believing they will compare well with all previous exhibitions, and greatly surpass many. They have awarded the first premium of $20, to Jedediah Estabrook, of Rutland, for his yellow ox.

The second premium, of $15, to Luke Baker, of Rutland, for his yellow ox.

And the third premium of $10 to Silas Dudley, of Mendon, an ox fattened under the care of Mr. Oliver B. Everett, well known in that section of the country for his skill and fidelity in this important branch of the farming interest.

The number of milch cows offered for premiums were seven, and one for exhibition only.

One by Matthew Connel, of Leicester, 6 years old.
" " Geo. Ainsworth, Worchester, 3 last spring.
" " Joseph Slayton, Brookfield, 7 years old.
" " W. Blanchard, Charlton, 7 years old.
" " T. B. Eaton, Worcester, 4 years old.
" " Daniel H. Fitch, Leicester.
" " James Leach, Southborough.

The cow offered for exhibition, was owned by J. P. Cushing, of Watertown, imported from England in 1836, of the Ayrshire breed, called the Venus, and deservedly so, as she was a beautiful specimen of that fine breed of cattle; and the committee and society are highly gratified at the interest taken in our shows, by distinguished agriculturists, in other sections of the state, and are particularly obligated to Mr. Cushing, who has made the society a splendid donation of a bull, of the Ayrshire breed.

The first premium of $15, was awarded to Wm. Blanchard of Charlton, for the best milch cow. From the 17th to the 27th of June, she gave twenty quarts of milk per day, and made 17 lbs. during that period. From the 10th to the 20th of September she gave 15 quarts of milk per day, and made 11½ lbs. of butter. The cow calved on the 26th of April, and the calf was slaughtered the 9th of June,—the calf weighed 110 lbs. —the skin, 15½ lbs.

The second premium of $10, was awarded to Thomas B. Eaton, of Worcester. From the 17th to the 27th June, she averaged 16 quarts of milk per day, weighing about 43 lbs. From the 10th to the 20th of September, 11 quarts of milk, Mr. Eaton states, "That since the middle of May, I have sold 1478 quarts of milk, and supplied my family, of from 8 to 10 in number, with milk and cream."

The third premium of $8, was awarded to Dana H. Fitch, of Leicester. Mr. Fitch made in three weeks in June 33¼ lbs. of butter from his cow, besides using 3 pints of new milk and some cream per day. In three weeks in September he made 21 lbs. 9 oz. of butter. From the second of June to the present time, he has made from this cow 148 lbs. of butter.

The other cows exhibited did not come in competition with those to whom premiums were awarded, as they had not complied with the requisitions of the society.

All of which is respectfully submitted,

C. C. P. HASTINGS, *Chairman.*

NATIONAL GALLERY OF MANUFACTURES AND AGRICULTURE.

From the Baltimore Sun.

Patent Office, Nov. 20, 1840.

Notice is given that the hall in the new *patent office* for the exhibition of manufactures, is now completed. The hall is spacious, being 273 feet long, 63 feet wide, 30 feet high, and *fire-proof.*

Agents whose names are annexed, will receive and forward, free of expense, articles which may be deposited with them. These articles will be classified and arranged for exhibition, and the name and address of the manufacturer (with the prices when desired) will be carefully affixed. Few, it is presumed, will neglect to improve the opportunity now presented of contributing their choicest specimens to the *national gallery of American manufactures,* where thousands who visit the seat of government will witness with pleasure the progress of the arts in these United States.

If fairs, in limited sections of our country, have excited interest, what must be the attractions of a national exhibition, enriched by daily additions.

The agriculturist may be gratified to learn, that commodious rooms are provided for the exhibition of agricultural implements, and also for the reception of seeds for exhibition or distribution.

The commissioner of patents, being authorized to collect agricultural statistics, avails himself of this opportunity to solicit information of the condition and character of the crops in the several sections of the country. These data will aid him in presenting, with his annual report, the aggregate amount of products of the soil, and it is hoped that the public may be guarded in some measure from the evils of monopoly, by showing how the scarcity in one portion of the land may be supplied from the surplus in another.

Names of agents who will receive and forward packages for the patent office. Collectors of the customs at Portsmouth, N. H., Portland, Me., Burlington, Vt., Providence, R. I., Philadelphia, Baltimore, Richmond, Charleston, Savannah, N. Orleans, Detriot, Buffalo, Cleveland. Surveyors of the customs--Hartford, Ct., St. Louis, Pittsburg, Cincinnati, Louisville; R. H. Eddy, Boston, Mass.; David Gardiner, (custom house) New York.

HENRY L. ELLSWORTH,
Commissioner of Patents.

Editors are very respectfully requested to give the above an insertion in their papers.

ALDERNEY COWS.

From the New England Farmer.

From a highly respected friend in Providence, we have received some inquiries respecting this breed of cows, and whether they are best suited

for beef or milk. We have seen several of them. They are small in size and generally inferior in shape and appearance, and seldom exhibit much thrift. They are not to be chosen for beef. They are not remarkable for giving great quantities of milk, but they are remarkable for giving milk of extraordinary richness; and persons in England and this country keep them for the sake of the rich cream for their tables. They are in general of a light red or a gray dun or fawn color, with small and crooked horns. Reuben Haines, of Germantown, Penn., in 1823, says—"I have now a little full bred Alderney cow, reared on my farm, which will be only four years old next harvest. She had her third calf on the first of last month; and on the nineteenth we had rather more than ten pounds of delicious butter from twelve quarts of her cream, obtained from fourteen milkings; that is, in one week. Her only food through the winter has been good hay and brewers' grains—the latter article well known to be useful in promoting the secretion of milk, but not increasing the quantity or improving the quality of the butter. One remarkable property of the cream of the Alderney cow is, the readiness with which it is converted into butter."

John Lawrence says, that "an Alderney cow that had strayed on the premises of a friend of his, and remained there three weeks, made nineteen pounds of butter each week, and the fact was held so extraordinary, as to be thought worthy of a memorandum in the parish books." (Farmers' Series.)

They are originally from Normandy, in France; and are said, when dried off, to fatten with great ease. They are constantly imported into England, being admired for the properties to which we have above referred; but some disappointment has occasionally occurred, for the true reason that the pasturage in England is not so good as in their native land. Like all other animals from whom we are to look for any thing valuable, they require liberal feeding and the best care. We must not expect impossibilities. We remember very well a friend's having purchased a cow from a town abounding in the richest pasturage; and upon taking her to his own inferior pastures she fell very much short of the yield which he had been informed she had been accustomed to give. He complained to the seller of the cow that she had not fulfilled his recommendation. "Why," said the farmer, "I sold you the cow, but I did not sell you my pastures too."

H. C.

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